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CATALOG OF SIMULATION MODELS AND WARGAMES USED FOR UNIT 1/3  
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PERFORMANCE DATA CENTER ORLANDO FL E P GRANT JAN 87

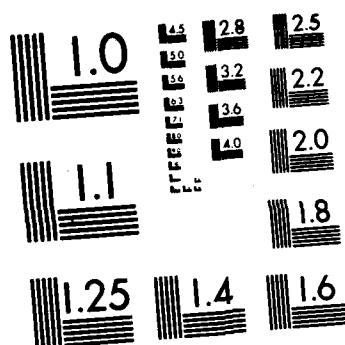
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# CATALOG OF SIMULATION MODELS AND WARGAMES USED FOR UNIT AND LEADER TRAINING

## SECOND EDITION

## JANUARY 1987

DEPARTMENT OF DEFENSE  
TRAINING AND PERFORMANCE DATA CENTER

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) This catalog provides a ready reference guide to simulation models and wargames used for leader and unit-level training within the military Services. It summarizes comparable information on automated and manual simulations available for unit training and military service school training. Extracted from other more inclusive and all-around catalogs, the catalog includes descriptions on 91 simulations models and wargames. Each description includes: title, category, proponent, developer, purpose, general description, date implemented, input, output, limitations, hardware, software, general data, POC, keywords, and catalog from which extracted. In addition, there are seven cross-reference tables which sort the contents by title, source catalog, host computer, level of training, major warfare area, proponent, joint training use.					
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## INTRODUCTION

The purpose of this catalog is to provide a ready reference, single source guide to simulation models and wargames used for leader and unit-level training within the Services. The goal is to summarize comparable information on automated and manual training simulations available for unit training and Military Service school training. This edition also includes descriptions of several simulations under development and several higher-level or non-training models and simulations which may have potential training application. Simulators used for individual training are not included in this catalog.

Seven cross-reference tables are included which describe the contents according to name, computer host, level of warfare, type of warfare, proponent agency and those used in Joint exercises and training.

This catalog is a revised edition of the December 1985 report. The material for the 91 simulation models and wargames described in this catalog was extracted from existing sources and reports which generally contain a wider scope of models and simulations used for analysis and research, as well as training. Some information on simulations under development was obtained telephonically from different sources.

Suggestions for enhancements, additions and questions are encouraged. The TPDC point of contact is Edward P. Grant, Collective and Joint Training Division, Defense Training and Performance Data Center, (305) 281-3623.



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The sources used for this catalog are listed in Table 1.

TABLE 1

<u>LIST OF CATALOGS</u>	<u>SOURCE</u>
<u>Catalog of Wargaming and Military Simulations Models</u> , 1986. Joint Analysis Directorate, Organization of The Joint Chiefs of Staff.	OJCS
<u>Catalog of Wargaming and Military Simulation Models</u> , 1982. Studies, Analysis and Gaming Agency, Organization of The Joint Chiefs of Staff (now The Joint Analysis Directorate, OJCS)	OJCS
<u>ABCA Catalog of War Games, Training Games, and Combat Simulations</u> , 1983. Quadripartite Working Group on Army Operational Research. Prepared by the Office of The Deputy Undersecretary of the Army (Operations Research).	USA(OR)
<u>United States Army Training Support Center Bulletin Number 84-1</u> , 1984. Headquarters, United States Army Training Support Center, Fort Eustis, Virginia.	ATSC
<u>Catalog of NOSC Simulation Capabilities and Models</u> , 1983. Naval Ocean Systems Center, San Diego, California.	NOSC
<u>NAVAIRDEVCEEN Computer Models</u> , 1984. Naval Air Development Center, Warminster, Pennsylvania.	NADC
<u>Inventory of Models</u> , 1985. Studies and Analysis Activity, Headquarters, TRADOC, Fort Monroe, Virginia	TRADOC

The 91 models described in this catalog are listed below with the data source, whether automated or manual, primary level of training and simulation and the page where the model is described. Abbreviations used in column c, LEVEL, are keyed from Table 4. Note, that in column B, if a simulation is listed A/M, it may be either automated or manual.

TABLE 2

ALPHABETICAL LIST OF THE SIMULATION MODELS

<u>NAME</u>	<u>AUTOMATED/ MANUAL</u>	<u>LEVEL</u>	<u>SOURCE</u>	<u>PAGE</u>
ACABUG	A	BN	OJCS	1
ADMIN MOD	M	BN	ATSC	3
ARTBASS	A	BN	OJCS	5
ASSAULT	A	THE	-	7
ATT	A	BDE	OJCS	9
BABAS	A	BN	OJCS	11
BALBOA	M	DIV	OJCS	13
"BAROSSA PEARL", Exercise	M	BN	OJCS	15
"BATMAN", Exercise	A/M	THE	OJCS	17
BATTLE	A	BN	OJCS	19
BGWG	A/M	BN	OJCS	23
BIG STICK	A	THE	OJCS	27
BLOCKBUSTER	M	BN	OJCS	29
Brigade/Unit War Game/CPX	M	BDE	OJCS	31
Brigade Level War Game/CPX	M	BDE	OJCS	35
CAMMS	A	BDE	OJCS	39
Canadian/Operat. War Game	A/M	BDE	OJCS	41
Canadian/Train. War Game	A/M	CORPS	USA/OR	43
CATTS	A	BN	OJCS	47
COMBATSIM	A	BDE	-	49
COMMANDER	A	MAJCOM	OJCS	51
COMM/EW Evaluation System	A	THE	OJCS	57
CORDIVEM	A	CORPS	OJCS	59
CRES	A	MAJCOM	-	63
DAMSEL	A	THE	OJCS	65
DBM	A/M	DIV	OJCS	67
Division Level War Game/CPX	M	DIV	OJCS	69
DIVLEV	A	DIV	OJCS	73
DIVWAG	A	CORPS	OJCS	77
DROMEDARY	A	THE	OJCS	79
DUNN-KEMPF	M	BN	OJCS	81
DWG	A/M	DIV	OJCS	83
FAST STICK II	A	MAJCOM	OJCS	85
First Battle	M	CORPS	OJCS	89
First Battle- B-C,	M	CORPS	ATSC	91
First Foray	M	DIV	USA/OR	93

TABLE 2  
(continued)

<u>NAME</u>	<u>AUTOMATED/ MANUAL</u>	<u>LEVEL</u>	<u>SOURCE</u>	<u>PAGE</u>
IBGTT	A	NAV	NOSC	97
ICOR	A	CORPS	OJCS	99
JANUS	A	CORPS	OJCS	101
JANUS/T	A	CORPS	OJCS	105
JESS	A	CORPS	-	107
JTLS	A	THE	OJCS	109
KORA	A	BN	OJCS	111
LANDING FORCE	A	BDE	OJCS	113
LOG-MAN-X	M	WING	OJCS	115
LOG MOD	M	BDE	ATSC	117
LOG-PLAN-X	M	SQDN	OJCS	119
M-14	A	BDE	OJCS	121
MACE	A	BDE	USA/OR	123
MAIN-MAN-X	A	WING	OJCS	125
MINI-STICK	M	FLIGHT	OJCS	127
"MOBILE STORE", Exercise	M	DIV	OJCS	129
MTM	A	CORPS	OJCS	131
NAVTAG	A	SHIP	OJCS	135
NEWAIR	A	THE	OJCS	137
"NEW PIN", Exercise	A	DIV	OJCS	139
NTE	M	THE	OJCS	143
NWCAM	A	THE	OJCS	145
NWGS	A	NAV	OJCS	147
OPSURV	A	CORPS	OJCS	149
PEGASUS	M	BDE	OJCS	151
REL-MAN-X	A	WING	OJCS	153
SAS	A	THE	OJCS	155
SEABAT	A	NAV	NADC	157
"SEA LION", Exercise	M	CORPS	USA/OR	159
SIMNET	A	BN	OJCS	161
SIMULOAD	A/M	DIV	OJCS	163
STEELTHRUST	M	BN	OJCS	165
SQUARE DEAL	M	BDE	OJCS	167
SUP-MAN-X	M	THE	OJCS	169
SUWAM III	A	DIV	OJCS	171
SYS-MAN-X	A	MAJCOM	OJCS	173
SYS-MAN-X Pert Phase	A	MAJCOM	OJCS	175
TACOPS	A	THE	OJCS	177
TACSIM	A	CORPS	USA/OR	179
TAC SUPPRESSOR	A	CORPS	OJCS	181
TACWAR-USMC	M	BN	OJCS	185
TAM	A	THE	OJCS	187
TAP	A	CORPS	OJCS	189
TEWTORIAL	A/M	BN	OJCS	191
TFG	A	BDE	OJCS	193

TABLE 2  
(continued)

<u>NAME</u>	<u>AUTOMATED/ MANUAL</u>	<u>LEVEL</u>	<u>SOURCE</u>	<u>PAGE</u>
TWSEAS FMC	A	DIV	NOSC	195
TWSEAS IMC	A	DIV	OJCS	199
TWSEAS MMC	A	DIV	NOSC	201
TWX	A	THE	OJCS	205
UNIFLO	M	N.AF	OJCS	207
VIC	A	CORPS	OJCS	209
WAR EAGLE	M	CORPS	ATSC	211
WASGRAM	A	NAV	OJCS	213
"WATER BUFFALO", Exercise	M	DIV	OJCS	215
WPC	A	THE	-	217

Table 3 breaks automated simulation models out by host computer.

TABLE 3

HOST COMPUTERS FOR AUTOMATED SIMULATIONS

<u>HOST COMPUTER</u>	<u>NAME</u>	<u>MACHINE</u>	<u>PAGE</u>
Apple Series	MACE	APPLE II	123
	OPSURV	APPLE II	149
	SIMNET	Apple MacIntosh	161
	TAP	APPLE II	189
CDC Series	COMMANDER	CDC Cyber 74	51
	DAMSEL	CDC Cyber 176,	
		CDC 6000	65
	DIVLEV	CDC 7600	73
	DIVWAG	CDC 6500	77
	ICOR	CDC 176	99
	KORA	CDC Cyber 175	111
	NEWAIR	CDC 6400	137
	SEABAT	CDC 6600	157
GE Series	CAMMS	GE	39
	REL-MAN-X	GE 625	153
Honeywell	BIG STICK II	Honeywell 6060	27
	DROMEDARY	Honeywell 6060	79
	FAST STICK II	Honeywell 6060	85
	MAIN-MAN-X	Honeywell 6000	125
	MTM	Honeywell 6060	131
	NWGS	Honeywell	147
	SYS-MAN-X	Honeywell 6000	173
	SYS-MAN-X PERT	Honeywell 6000	175
	TWX	Honeywell 6060	205
HP Series	Exercise Batman	HP 9825A	17
	Exercise New Pin	HP 9845	139
IBM Series	ASSAULT	IBM 4381	5
	FAST STICK II	IBM 360	85
	SAS	IBM 3033 & 2-PCs	155
	TAC SUPPRESSOR	IBM 370, 3330	181
	WASGRAM	IBM 370/158	213
LSI Series	Canadian/OP/Game	LSI 11/23	41
	Canadian/TNG/Game	LSI 11/23	43

TABLE 3  
(continued)

<u>HOST COMPUTER</u>	<u>NAME</u>	<u>MACHINE</u>	<u>PAGE</u>
UNIVAC Series	TWSEAS FMC	UNIVAC AN-VYK-7	195
	TWSEAS IMC	UNIVAC AV-VYK-7	199
	TWSEAS MMC	UNIVAC AN-VYK-7	201
	JANUS/T	UNIVAC 1100/82	105
VAX Series	COMMANDER	VAX 11/780	51
	CORDIVEM	VAX 11/780	59
	DWG	VAX 11/780	83
	IBGTT	VAX 11/780	97
	JANUS	VAX 11/780	101
	JANUS/T	VAX 11/780	105
	JESS	VAX 8600 & MicroVax II	107
	JTLS	VAX 8600	109
	TACSIM	VAX 11/780	179
	TAC SUPPRESSOR	VAX 11/780	181
	VIC	VAX 11/780	209
	WPC	VAX 11/785	217
WANG Series	BATTLE	WANG 2200 Mini	19
	FAST STICK II	WANG micro	85
Others:			
	ACABUG	PERQ Micro	1
	ARTBASS	PERKIN ELMER	5
	BABAS	CORVUS	11
	BGWG	DATAPOINT 6600	23
	CATTS	XEROX E 9	47
	COMM/EW	PDP 11	57
	DBM	Digital	67
	M-14	Cray 1S	121
	NAVTAG	WICAT 150-3 & AXIOM EX-1650	135
	NWCAM	microcomputer	145
	SUWAM III	KAYPRO II	171
	TACOPS	ACS 8000-10	177
	TEWTORIAL	Sinclair ZX81	191
	TFG	ICL 2900	193



Table 4 breaks out the simulation models by the level of training or game play. Abbreviations in parenthesis are used in table 2.

TABLE 4

MODELS BY LEVEL OF TRAINING

<u>NAME</u>	<u>PAGE</u>
<u>Army/USMC Battalion (BN), Air Force Flight (FLIGHT) or Squadron (SQDN), or lower level</u>	
ACABUG	1
ADMIN MOD	3
ARTBASS	5
BABAS	11
Exercise Barossa Pearl	15
BATTLE	19
BGWG	23
BLOCKBUSTER	29
CATTS	47
DUNN-KEMPF	81
KORA	111
LOG-PLAN-X	119
MINI-STICK	127
SIMNET	161
STEELTHRUST	165
TACWAR - USMC	185
TEWTORIAL	191
<u>Army Brigade (BDE), Navy (Ship), USMC (MAB), Air Force Wing (WING), or lower level</u>	
ATT	9
Brigade/Unit War Game/CPX	31
Brigade Level War Game/CPX	35
CAMMS	39
Canadian/Operat. War Game	41
COMBATSIM	49
LANDING FORCE	113
LOG-MAN-X	115
LOG MOD	117
M-14	121
MACE	123
MAIN-MAN-X	125
PEGASUS	151

TABLE 4  
(continued)

<u>NAME</u>	<u>PAGE</u>
NAVTAG	135
REL-MAN-X	153
SQUARE DEAL	167
TFG	193

Army/USMC Division (DIV), USMC (FMF), or Numbered Air Force (N.AF), level or below

BALBOA	13
DBM	67
Division/War Game/CPX	69
DIVLEV	73
DWG	83
FIRST FORAY	93
Exercise Mobile Store	129
Exercise New Pin	139
SIMULOAD	163
SUWAM III	171
TWSEAS FMC	195
TWSEAS IMC	199
TWSEAS MMC	201
UNIFLO	207
Exercise Water Buffalo	215

Army Corps (CORPS), Air Force Major Command (MAJCOM), or below

Canadian/Training War Game	43
COMMANDER	51
CORDIVEM	59
CRES	63
DIVWAG	77
FAST STICK II	85
First Battle	89
First Battle B-C	91
ICOR	99
JANUS	101
JANUS/T	105
JESS	107
MTM	131
OPSURV	149
SYS-MAN-X	173
SYS-MAN-X PERT	175
WAR EAGLE	211

TABLE 4  
(continued)

<u>NAME</u>	<u>PAGE</u>
Exercise SEA LION	159
TACSIM	179
TAC SUPPRESSOR	181
TAP	189
VIC	209
 <u>Naval Task Force or Naval Battle Group Level (NAV)</u>	
IBGTT	97
NWGS	147
SEABAT	157
WASGRAM	213
 <u>Theater or Global Level (THE)</u>	
ASSAULT	7
Exercise Batman	17
BIG STICK	27
COMM/EW	57
DAMSEL	65
DROMEDARY	79
JTLS	109
NEWAIR	137
NTE	143
NWCAM	145
SAS	155
SUP-MAN-X	169
TACOPS	177
TAM	182
TWX	205
WPC	217

Table 5 breaks out the simulation models by major warfare area.

TABLE 5

SIMULATION MODELS BY MAJOR WARFARE AREA

<u>NAME</u>	<u>PAGE</u>
<u>Air:</u>	
BALBOA	13
BIG STICK	27
COMMANDER	51
COMM/EW	57
CRES	63
DIVWAG	77
DROMEDARY	79
FAST STICK II	85
MTM	131
MINI-STICK	127
M-14	121
NEWAIR	137
NTE	143
NWCAM	145
<u>Land:</u>	
ACABUG	1
ARTBASS	5
BABAS	11
Exercise Barossa Pearl	15
BATTLE	19
BGWC	23
BLOCKBUSTER	29
Brigade/Unit War Game/CPX	31
Brigade Level War Game/CPX	35
CAMMS	39
Canadian/Operational War Game	41
Canadian/Training War Game	43
CATTS	47
COMBATSIM	49
DBM	67
Division/War Game/CPX	69
DUNN-KEMPF	81
DWG	83
First Battle	89
First Battle B-C	91
FIRST FORAY	93
JANUS	101
JANUS/T	105
KORA	111
PEGASUS	151
Exercise Sea Lion	159

TABLE 5  
(continued)

<u>NAME</u>	<u>PAGE</u>
SIMNET	161
SQUARE DEAL	167
SUWAM III	171
TACSIM	179
TACWAR-USMC	185
TAP	189
TEWTORIAL	191
TFG	193
VIC	209
WAR EAGLE	211
WASGRAM	213
Exercise Water Buffalo	215
WPC	217
 <u>Sea/Amphibious:</u>	
ATT	9
IBGTT	97
LANDING FORCE	113
NAVTAG	135
NWGS	147
SEABAT	157
STEELTHRUST	165
SUWAM III	171
TWSEAS FMC	195
TWSEAS IMC	199
TWSEAS MMC	201
 <u>Joint:</u>	
Exercise Batman	17
CRES	63
JESS	107
JTLS	109
MTM	131
TACOPS	177
WPC	217
 <u>General War:</u>	
DIVLEV	73
DIVWAG	77
ICOR	99
MACE	123
OPSURV	149
SAS	155
TAC SUPPRESSOR	181

TABLE 5  
(continued)

<u>NAME</u>	<u>PAGE</u>
TAM	187
TWX	205
WASGRAM	213
 <u>Other:</u>	
<u>Economic</u>	
DROMEDARY	79
 <u>LOGISTICS</u>	
ADMIN MOD	3
ASSAULT	7
DAMSEL	65
LOG-MAN-X	115
LOG MOD	117
LOG-PLAN-X	119
MAIN-MAN-X	125
Exercise MOBILE STORE	129
Exercise NEW PIN	139
REL-MAN-X	153
SIMULOAD	163
SUP-MAN-X	169
SYS-MAN-X	173
SYS-MAN-X (PERT Phase)	175
UNIFLO	207

TABLE 6

SIMULATION MODELS AND WARGAMES BY PROPONENT

PROPONENT AGENCY:	PAGE NO.
SIMULATION, MODEL OR WARGAME	
<u>UNITED STATES</u>	
Joint Analysis Directorate (JAD), OJCS	
JTLS	109
US Readiness Command (USREDCOM)	
JESS	107
National Defense University (NDU)	
SAS	155
SUWAM III	171
Director, Net Assessment (ONA), OSD, The Pentagon	
SAS	155
TAM	187
Defense Nuclear Agency (DNA)	
ICOR	99
OPSURV	149
Defense Advanced Research Projects Agency (DARPA)	
SIMNET	161

TABLE 6  
(continued)

PROPONENT AGENCY: PAGE NO.

SIMULATION, MODEL OR WARGAME

ARMY:

US Army Combined Arms Training Activity (CATA)

ADMIN MOD	3
ARTBASS	5
BABAS	11
BLOCKBUSTER	29
CAMMS	39
CATTS	47
COMBATSIM	49
DUNN-KEMPF	81
FIRST BATTLE	89
FIRST BATTLE - B-C	91
LOG MOD	117
PEGASUS	151
TAP	189
WAR EAGLE	211

US Army Logistics Center (LOGCEN),

ASSAULT	7
DAMSEL	65

US Army TRADOC Analysis Center (TRAC)

ACABUG	1
BATTLE	19
DBM	67
JANUS	101
JANUS/T	105
VIC	209

US Army Material Command (AMC),

COMM/EW	57
---------	----

US Army Combined Arms Research Activity,  
(CAORA)

CORDIVEM	59
MACE	123



TABLE 6  
(continued)

PROPONENT AGENCY:	PAGE NO.
SIMULATION, MODEL OR WARGAME	
US Army Material Systems Analysis Activity, (AMSAA)	
DIVLEV	73
US Army Combined Arms Combat Development Activity, (CACDA)	
DIVWAG	77
US Army War College	
MTM	131
TACOPS	177
US Army Intelligence Center and School	
TACSIM	179
<u>AIR FORCE:</u>	
Tactical Air Command Liaison Office	
COMMANDER	51
Military Airlift Command	
M-14	121
Air University	
CRES	63
MINI-STICK	127

TABLE 6  
(continued)

PROPONENT AGENCY:	PAGE NO.
SIMULATION, MODEL OR WARGAME	
Air War College (AWC)	
TWX	205
NTE	143
US Air Force Squadron Officers School (SOS)	
BALBOA	13
Air Command and Staff College	
BIG STICK	27
DROMEDARY	79
FAST STICK II	85
US Air Force Institute of Technology, School of Systems and Logistics	
LOG-MAN-X	115
LOG-PLAN-X	119
MAIN-MAN-X	125
REL-MAN-X	153
SIMULOAD	163
SUP-MAN-X	169
SYS-MAN-X	173
SYS-MAN-X (PERT)	175
UNIFLO	207
Headquarters SAC, DCS Operational Plans	
NTE	143
Electronic Warfare Management Group, (ASD/RWX)	
TAC SUPPRESSOR	181

TABLE 6  
(continued)

PROPONENT AGENCY:	PAGE NO.
SIMULATION, MODEL OR WARGAME	
<u>NAVY:</u>	
Naval Ocean Systems Center (NOSC)	
IBGTT	97
Naval Air Development Center NAVAIRDEVCON	
SEABAT	157
US Naval Ocean System Center (NOSC)	
TWSEAS FMC	195
TWSEAS MMC	201
US Naval Training System Center (NTSC)	
TWSEAS IMC	199
Chief of Naval Operations, OP39	
ATT	9
NAVTAG	135
Chief of Naval Operations, OP 91	
WASGRAM	213
US Naval War College	
NWCAM	145

TABLE 6  
(continued)

PROPONENT AGENCY: PAGE NO.

SIMULATION, MODEL OR WARGAME

USMC:

HQ US Marine Corps, (Code T)

LANDING FORCE	113
STEELTHRUST	165
TACWAR - USMC	185

USAREUR/USAFE:

HQ US Army/HQ US Air Force, Europe

WPC	217
-----	-----

ALLIED COUNTRIES:

MA4 and MA2 Branches, RARDE, England

BGWG	23
TEWTORIAL	191

Operational Research And Analysis Establishment,  
Ottawa, Canada

Brigade and Unit War Game Assisted CPX	31
Brigade Level War Game Assisted CPX	35
Canadian Land Forces Training War Game	43
Canadian Land Forces Operational War Game	41
Division Level War Game Assisted CPX	69
SQUARE DEAL	167

Central Studies Establishment, Canberra,  
Australia

BAROSSA PEARL	15
BATMAN	17
MOBILE STORE	129
NEW PIN	139
SEA LION	159
WATER BUFFALO	215

TABLE 6  
(continued)

PROPONENT AGENCY:

PAGE NO.

SIMULATION, MODEL OR WARGAME

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HQ, New Zealand Land Forces, (HQ NZLF), Takapuna,  
Auckland, New Zealand

FIRST FORAY

93

SHAPE Technical Centre, HQ SHAPE, Belgium

NEWAIR

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TABLE 7

SIMULATIONS, MODELS AND WARGAMES USED IN JOINT  
TRAINING AND EXERCISES

<u>NAME</u>	<u>PAGE</u>
Exercise BATMAN	17
CORDIVEM	59
* CRES	63
JESS	107
JTLS	109
* JWC - Joint Warfare Center, MacDill AFB, FL	na
MTM	131
SUWAM III	171
SIMNET	161
TACOPS	177
* WPC	217

\* These are warfare simulation centers which in effect are large simulations made up of component parts that often are themselves simulations and models.

## DATA COLLECTION FORMAT

The descriptive material in this report is derived from the source documents indicated in table 1. Obvious out-of-date information was updated by TPDC, January 1987. The format used in this report, with slight variations, is that used by OJCS in its Catalog of Wargaming and Military Simulation Models. The format, including definitions of data elements, follows:

TITLE: Acronym and full name.

MODEL CATEGORY: Training, analytical, research, etc.

PROPONENT: Organization primarily responsible for maintaining model.

DEVELOPER: Organization/Corporation which developed current version of the model.

PURPOSE: This section contains a brief narrative which describes basic information on the model, the role the model plays, and the problem(s) the model addresses.

GENERAL DESCRIPTION: This section is a brief narrative covering modeling techniques (e.g., deterministic vs stochastic), level of detail and game time - real time relationship.

DATE IMPLEMENTED:

INPUT: Scenario, weapons characteristics, unit size, arrival dates, movement tables, etc.

OUTPUT: Computer printout, plots, raw data, statistically analyzed data, locations losses, etc.

MODEL LIMITATIONS: Examples include: Number of targets, geography, time, number of units played, etc.

HARDWARE:

- Type computer:
- Operating system:
- Minimum storage required:
- Peripheral equipment:

SOFTWARE:

- Programming language:
- Documentation identification:
- Documentation availability: (includes DDC accession numbers, if assigned)

DATA COLLECTION FORMAT (continued)

GENERAL DATA:

Time requirements: Includes time to prepare the data base, amount of CPU time per cycle, and time for data output analysis.

Classification: Security classification of the model itself, not the data used or generated by it.

Frequency of use: This information provided by known users, the proponent and the developer.

Miscellaneous: Supercessions, changes, linkages with other models, etc.

POINT OF CONTACT: Organization, including address, and telephone number, from which additional information can be obtained.

KEYWORD LISTING: String of single words appropriate for indexing the model in an automated system, e.g., computerized, analytical, nuclear, damage-assessment, missiles, strategic.

CATALOG LISTING: That data source from which the entry in this catalog was obtained. (TPDC added entry)





TITLE: ACABUG - American Canadian Australian British Urban Game

MODEL CATEGORY: Military operations in urbanized terrain

PROPOSER: U.S. Army TRADOC Analysis Center (TRAC) White Sands Missile Range, NM 88002-5502

DEVELOPER: TRAC, White Sands Missile Range, NM 88002- 5502

PURPOSE: ACABUG was designed and developed as an analytical tool principally to study the material and tactical aspects of MOUT. However, the model is capable of representing a defensive reinforced infantry company or an armored battalion against an appropriate threat force in either an urban or rural environment.

DESCRIPTION: ACABUG is a two-sided, stochastic, high resolution, computer-assisted MOUT war game using three-dimensional terrain boards on a scale of 1:500. Computer resolution is to the individual rooms for each represented building. Players move and deploy 1:500 scale miniatures on the terrain board to establish line-of-sight, detection and engagement opportunities. Any engagements are initiated by the players by means of an input order to the computer. The following combat functions are modeled in the computer: direct fire, indirect fire, movement, mount/dismount, communications, target acquisition and building clearance. Other functions such as minefields and obscurations are played through manual rules. The computer accesses and gives results, keeps a "scoreboard," and provides a history file. Orders may be given to organizational and aggregated platforms and are broken down into individual platform orders. Due to high resolution, the ratio of game time to real time is approximately one minute of game time to 2 hours of real time.

INPUT: Source data input programs and data base editors are provided. The data are partitioned into three areas: terrain, systems performance and force organization. For a given study, only force organization data and portions of the system performance data would need to be changed.

OUTPUT: The primary output of the model is through a graphics display using windows to partition the information among the players, controllers and operators. This is dynamic information with prompts for player response. The player information is projected onto television monitors for use at the terrain boards. Hardcopy of anything on the display can be provided by the laser printer within 24 seconds. Static status displays are also provided. A postprocessor provides a killer/victim scoreboard.

LIMITATIONS: Since there is man-in-the-loop decision-making, the model cannot be replicated. The number of maneuver platforms (vehicles, personnel and airborne) is limited to 6,000 and the number of buildings to 4,000 (80 different types). Minefields, NBC, obscuration or night operations presently cannot be played in the automated mode.

HARDWARE: Computer (OS): PERQ microcomputer (POS-PERQ)

Storage: 24 Mbytes

Peripherals: Canon Laser Beam Printer Model LBP-10 and  
Scan-Tron Model 5200 Optical Mark Reader

SOFTWARE: Programming Language: PASCAL

Documentation: TRASANA TR-53-82, ACABUG Concept Design  
- Weapons Effects Urban Terrain and  
Force Organization Data Base, October  
1982;  
TRASANA TR-31-83, ACABUG User Manuals  
(draft); the ACABUG Overview is  
approved for public release and  
unlimited distribution.

GENERAL DATA:

Classification: UNCLASSIFIED (without input data)

Time requirements: Data Base: 10 man-months  
CPU Time per Cycle: requires a  
dedicated PERQ microcomputer  
Data Output Analysis: 5 minutes  
(generation of killer/victim  
scoreboard)

Frequency of use: 4 times per year

Users: HEL, USAIS

POINT OF CONTACT: (Proponent and Developer)  
Mr. R. Heath, AV258-4486

KEYWORDS: Analytical, two sided, stochastic, high  
resolution, computer assisted, MOUT

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: ADMIN MOD Administration Module

MODEL CATEGORY: Unit Training - Manual Wargame

PROPONENT: Combined Arms Training Activity, Fort Leavenworth, Kansas.

DEVELOPER: As above.

PURPOSE: Enhance training of Battalion/Brigade S1 and company personnel. Establish interaction between S1 and S4 at battalion/brigade level.

GENERAL DESCRIPTION: The ADMIN MOD is designed to enhance the training of Battalion and Brigade S1 and company level personnel by simulating the demands to manage personnel imposed on the S1 in combat. To assure realism, ADMIN MOD operates with the unit's combat personnel SOP and the S1 and battalion Personnel Administration Center (PAC) located in their combat configuration. ADMIN MOD operates in conjunction with PEGASUS, CAMMS, CATTS, and FIRST BATTLE to simulate personnel management/strength accounting, casualty reporting, and replacement acquisitioning. ADMIN MOD controllers interface with the game board to assess casualties and report personnel losses in accordance with the unit's SOP.

INPUT:

- O Unit SOP
- O Operations Order
- O Plans

OUTPUT: Tactical personnel management problems requiring planning and coordination in order to solve, similar to that required in combat.

LIMITATIONS: Limited to personnel and related staff elements within a battalion and brigade.

HARDWARE: N/A

SOFTWARE: GTA 101-2-1. A video tape, 950-777-0808-D, is available through Army Training Aids Support Centers. It provides the details on use of ADMIN MOD in support of battle simulations.

GENERAL DATA:

Time requirements: Training required to prepare for play: 1-9 hours  
Security classification: Unclassified  
Frequency of use: User determined  
Users: Army battalion and brigade staffs

POINT OF CONTACT: Combined Arms Training Activity  
ATTN: ATZL-TAS  
Fort Leavenworth, KS 66027  
(913) 684-3189  
Autovon 552-3189

KEYWORD LISTING: N/A

CATALOG LISTING: United States Army Training Support  
Center Bulletin Number 84-1. Headquarters, United States  
Army Training Support Center, Fort Eustis, Virginia.

TITLE: ARTBASS - Army Training Battle Simulation System

MODEL CATEGORY: Training. Conflict other than strategic nuclear, corps or lower level/ground forces only.

PROPONENT: Combined Arms Training Activity, (CATA)  
Fort Leavenworth, Kansas

DEVELOPER: Combined Arms Training Activity

PURPOSE: Through use of a real time battle simulation and a computer graphics display system a battalion commander and staff may be exercised in the command and control realities that will be encountered on the modern integrated battlefield. Permits battalion commander to observe and evaluate ability of his staff to respond to input normally received from subordinate units on a tactical situation. Allows for alternate courses of action to be exercised and evaluated for effectiveness.

GENERAL DESCRIPTION: Lanchester theory used to drive weapons effects, unit attrition, excepted values used to determine unit movement, equipment performance curve fit for determining levels of suppression probability theory in line of sight, maintenance factions, etc.

INPUT:

- O Order of battle
- O Firing rates
- O Kill probabilities
- O Mobility
- O Terrain and weather
- O Specific unit order
- O Firing commands

OUTPUT:

- O Sides display of unit locations and battlefield control information
- O Real-time CRT output reports of unit battlefield activity
- O Summary listings over time describing unit status

HARDWARE: Perkin Elmer (EXEC P)

SOFTWARE:

- O Programming Language: FIN, some assembler
- O Documentation: Pending

GENERAL DATA:

Time requirement: Approximately 5 hours of controller training time required to assure efficient training operation.

Security Classification: UNCLASSIFIED

Frequency of Use: Being fielded.

Users: Battle Simulations Directorate, CATA. When fielded, users will be battalion-level, combat arms units in the Army.

Miscellaneous: ARTBASS is a mobile version of CATTS (Combined Arms Tactical Training Simulation). Nuclear chemical package and logistics play.

POINT OF CONTACT: CDR, Combined Arms Training Activity  
ATTN:ATZL-TAS-S  
Fort Leavenworth, Kansas 66027-7000  
AUTOVON 552-3180  
Commercial (913) 684-3180

KEYWORD LISTING: Computerized, Analytical, Damage assessment, Tactical, Real-time, BN Command and Control Trainer

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of The Joint Chiefs of Staff.

TITLE: ASSAULT - Automated Support System for Army Unit Logistics Training.

MODEL CATEGORY: Logistics command and staff training

PROPONENT: US Army Logistics Center, Fort Lee, VA

DEVELOPER: US Army Logistics Center, Fort Lee, VA

PURPOSE: Commander and staff trainer for Combat Service Support units from battalion thru echelons above corps.

GENERAL DESCRIPTION: Used to develop and conduct exercises in the classroom and unit environment. Simplistic stochastic combat driver which creates casualties, supply consumption, battlefield results to drive the exercise. Tracks assets, calculates consumption, stocks-on-hand, transports loads and makes deliveries. Acts as a bookkeeper for supply exercise supply units.

DATE IMPLEMENTED: Under development. To be field tested, August 1987, and fielded, August 1988 during LOGEX 88.

INPUT: Automated exercise builder to create appropriate scenario for the logistics training planned.

OUTPUT: Standard reports that the training audience would normally receive in real-life situation for management actions to be trained. Information reports needed by company-level player personnel.

LIMITATIONS: Not a combat trainer.

HARDWARE:

Computer: IBM 4381  
Operating System: IBM OS  
Storage: TBA  
Peripherals: TBA

SOFTWARE:

Programming Language: COBOL  
Documentation: User Manual, Maintenance Manual, and Operating Manual to be developed.

GENERAL DATA:

Classification: Unclassified.

Time requirements:

Frequency of use:



Users: LOGCEN

POINTS OF CONTACT: Proponent and Developer,  
Mr. Al D'amour  
US Army LOGCEN  
Exercise Simulations Branch, Unit Training  
Directorate (ATCL-LTJ)  
Fort Lee, Virginia 23801-6000  
Comm: 804-734-1556

KEYWORDS:

CATALOG LISTING: No listing as of date of publication.

TITLE: ATT - Amphibious Tactical Trainer

MODEL CATEGORY: Conflict other than strategic nuclear-  
amphibious warfare

PROPONENT: Chief of Naval Operations, OP 39

DEVELOPER: Naval Training Systems Center, Orlando, FL  
32813

PURPOSE: ATT is proposed to have the capability of conducting Amphibious Command and Control Team Training for shipboard and staff personnel as members of ship's company CATF of CLF staff assigned to TACC, SACC, HDC, CIC, DEBARK, CONTROL, LFOC, TACLOG, and FLAG PLOT command stations.

DESCRIPTION: ATT is proposed to be a multi-purpose, multi-echelon training system designed to exercise Commander Amphibious Task Force (CATF) and Commander Landing Force (CLF), and their staffs, in tactical decisionmaking in a realistic operational environment. ATT will also be used to train/exercise selected teams in previously acquired, amphibious warfare related operational skills. It will be a real-time, two-sided simulation based largely on stochastic models.

DATE IMPLEMENTED: December 1990 (estimated device acceptance)

INPUT:

OUTPUT:

LIMITATIONS:

HARDWARE:

Computer (OS):

Storage:

Peripherals:

SOFTWARE:

Programming Language:

Documentation:

GENERAL DATA:

Classification:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Frequency of use: Estimated to be 100 hours/month

Users: Amphibious Forces, Fleet Marine Forces,  
NAVPHIBSCOL LITTLE CREEK, NAVPHIBSCOL CORONADO

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: BABAS - Battalion Automated Battle Simulation

MODEL CATEGORY: Conflict other than strategic nuclear/  
ground forces only - conventional conflict

PROPONENT: Combined Arms Operations Research Activity  
(CAORA), Fort Leavenworth, KS.

DEVELOPER:

PURPOSE: BABAS is designed to exercise commanders and their staffs at battalion level with normal combat support and combat service support elements in a simulated combined arms combat environment against appropriate enemy forces in command and control and staff coordination.

GENERAL DESCRIPTION: BABAS is a microcomputer-assisted, two-sided, training model. Video disks contain standard 1:50,000 military map sheets. Unit symbols, obstacles, control measures, and battle status symbology are overlaid on this display. Digitized terrain data are used to determine intervisibility, and terrain appreciation overlays are available on request.

INPUT: Order of battle, movement, air/indirect fire support, obstacles/control measures and resupply.

OUTPUT: Computer printouts stating combat results, fuel and ammunition usage, remaining status, KIA/MIA, and meantime to repair/return to combat; detailed post game summary available at end of exercise.

MODEL LIMITATIONS: Units played and logistic/administration items tracked are limited to those which already exist within the data base. Currently, digitized terrain is available for the Fulon Gap area only. A video disk is available for Fulon Gap, Sinai/Mitla Pass, and NTC (Fort Irwin).

HARDWARE:

Computer (OS): CORVUS  
Memory: 512k RAM  
Storage: 20 Mbytes  
Peripherals: SYMTEx graphic display devices, color monitors, OK joysticks, video disk players, Okidata printers, CORVUS hard disks

SOFTWARE:

Programming Language: PASCAL  
Documentation:

GENERAL DATA:

Time requirements: Data Base: preparation - 1 week  
Set-up Time: several weeks initial  
controller training, 6 to 8 hours  
player learning time  
CPU Time per Cycle: variable  
Data Output Analysis:  
Frequency of Use: 3 to 4 times per month  
Security classification:  
Users: Fort Lewis, WA.  
Miscellaneous:

POINTS OF CONTACT: (Proponent): CPT R. Vatis, AV552-2869/  
4826

KEYWORD LISTING: Two sided, training, battle simulation,  
command and control.

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: BALBOA - Aerospace Employment Exercise

MODEL CATEGORY: Conflict other than strategic nuclear/air  
combat - many-on-many

PROPONENT: Squadron Officer School (SOS), Maxwell AFB, AL

DEVELOPER: SOS

PURPOSE: Operation BALBOA permits students to synthesize military force employment concepts and command staff tasks associated with force employment within the scenario of a joint task force conventional military operation.

DESCRIPTION: Operation BALBOA is a manual model designed to illustrate how USAF aerospace forces - strategic and tactical - work in concert with land and sea forces to deter conflict, to resolve a conflict at the lowest level of intensity and to restore peace. Each student functions as a staff officer in a joint task force headquarters as a member of a Tactical Air Control Center (TACC). The student plans and conducts tactical air operations in a subtheater conventional war environment. The seminar activity concentrates on the employment of tactical aerospace forces in a community insurgency in Latin America. Throughout the exercise, the students receive force posture information on SAC and NORAD to illustrate the coordinated response of all the combat elements of U.S. aerospace power to a threat in any part of the world. The students assess the threat on the basis of intelligence reports and then accomplish the mission specified in their operations plans within limitations imposed by political decisions made at the national level.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: Manual scoring is slow, cannot generate additional hostile activity, and limited to approximately 10 to 12 students per team.

HARDWARE:

Computer (OS):

Storage:

Peripherals:

SOFTWARE:

Programming Language:

DOCUMENTATION: Manuals, seminar handouts, tapes and plans are provided by SOS

GENERAL DATA:

Time Requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Classification:

Frequency of Use:

Users: SOS

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: Exercise Barossa Pearl

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: Central Studies Establishment, Australia.

DEVELOPER: As Above

PURPOSE: Exercise Barossa Pearl is a tactical training war-game designed to exercise students in the application of the principles of tactics and staff work for the four phases of war at Bn/TF level.

GENERAL DESCRIPTION: Barossa Pearl is a closed two-sided game designed for training at TF/Bn HQ level and for Tactical special to Corps and general courses. It may be played as a HQ game with emphasis placed on staff work and planning or as a series of separate games played simultaneously employing small player groups in the order of three to four players. The game can cater for free play with general training objectives or be played in discreet steps designed to place emphasis on special aspects of training. The game can be played in real time with discreet time jumps at periods of low activity. Game resolution is down to platoon level. When the game is played to such settings that demand specialist weapons such as TOW etc., the relationship between play time and real time can be less than real time.

INPUT: An operational Plan, Planning Data are provided in the handbook.

OUTPUT: Consequence of players actions

LIMITATIONS: Adjudication rules have to be simplified to cater for quick manual adjudications.

HARDWARE: Game handbook

SOFTWARE:

STAFF:

- O Control 3 officers and 3 NCOs
- O Player teams
  - As a HQ game, key personnel on a Bn/TF HQ in the order of 12-18 persons per team
  - In the multi-play mode, 3-4 players per team



GENERAL DATA:

Time requirements:

- O Preparation: 3 hours for preparation of the HQ and familiarization with the handbook.
- O Play: 2 1/2 days, one being equal to 10 hours.
- O Analysis: For 30 hours of play, about 3 hours.

Security classification: UNCLASSIFIED

Frequency of use: 3 plays per year.

Users: Training Gps, TF HQ and Infantry Centre. (The settings are changed to suit each user)

Miscellaneous: As game play is increased and experience based is enlarged more involved adjudication rules covering a broader spectrum of events will be introduced into game play. Two more games of similar characteristics have been developed; they are EX "KOKODA" and EX "DISTANT DRUM". The above games have similar training characteristics but incorporate different settings and types of ORBATs.

POINT OF CONTACT:

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS.

TITLE: Exercise Batman - Battle Management and Strike Effectiveness War Game

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: Central Studies Establishment, Australia.

DEVELOPER: As Above

PURPOSE: Exercise Batman is a manual war game that may be assisted by a small desk computer. The game is designed to assist joint training of Army and Air Force personnel in battle management techniques and the effectiveness of air-to-surface and air-to-surface weapons.

GENERAL DESCRIPTION: Batman is a two-sided, free play war game designed to demonstrate the effectiveness of surface-to-air to surface weapons in the context of an air ground battle. The game provides a facility for training exercise participants in the management of resources during an air ground battle, the flow of information of battle tactics at both inter and intra service levels, testing existing doctrine and the examination of new concepts of operations.

INPUT: A concept of operations plans for both air and ground force, planning data are provided in the handbook.

OUTPUT: Consequence of players action.

MODEL LIMITATIONS: When used in computer assisted mode the game is dependent on a computer (Hewlett-Packard 9825A) and its support staff. When used in manual mode rules have to be simplified to cater for quick manual adjudication.

HARDWARE: Hewlett-Packard 982A

SOFTWARE: Hewlett-Packard 982A Program

GENERAL DATA:

Time requirements: Approximately four and a half full working days should be allowed for the running of the exercise.

- O 1/2 day for briefing and exercise preparation
- O Demonstration play - 1/2 day
- O 3 days for play
- O 1 day = 8 hours
- O Game play will be in real time with a game time jump when appropriate

Security classification: CONFIDENTIAL

Frequency of use: Has not been played for four years.

Users: Joint Services Air Defense Course; RAAF Staff College

Miscellaneous: As the game play is increased and the experience base is enlarged, the game will be expanded to cater for more operational staff work.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1982. Studies, Analysis and Gaming Agency, OJCS. (Now, Joint Analysis Directorate, OJCS)

TITLE: BATTLE - Battalion Analyzer and Tactical Trainer  
for Local Engagements

MODEL CATEGORY: Conflict other than strategic  
nuclear/ground forces only - conventional conflict.

PROPONENT: US Army TRADOC Analysis Center (TRAC)

DEVELOPER: US Army TRADOC Analysis Center (TRAC)

PURPOSE: BATTLE is a computer-assisted "General War" battalion task force model used for training, as an analytical tool for development or evaluation of operational and organizational concepts, for evaluation of combat phenomenology not readily addressed by high resolution computer simulations such as CARMONETTE and CASTFOREM, for scenario development in support of computerized models, and for rapid screening of alternatives.

GENERAL DESCRIPTION: BATTLE is a stochastic, two sided computer-assisted manual terrain board model capable of resolution simulation of all of the elements of a US combined arms task force against the first echelon of a threat motorized or tank division. Resolution is to the individual soldier. The model is capable of simulating ECM/ECCM, mines, obscurants, close air support, attack and scout helicopters, all indirect fire and direct fire systems, logistics and recovery operations, air defense artillery, and limited NBC play. The model uses teams of US and Threat players and a team of controllers. The WANG minicomputer is used to resolve all direct and indirect firing events, mine engagements, acquisition, and other combat phenomenology. It also provides a complete coroners report and analytical post-processor.

INPUT:

- 0 Detailed scenario and RED and BLUE operation orders
- 0 Specific RED and BLUE task organization
- 0 Probabiltiy of hit and probability of kill given a hit for all firing systems against all allowable targets for all ranges and target environments
- 0 Weapon basic load data
- 0 Platform dimensions
- 0 Weapon operational characteristics
- 0 Communications electronics operational characteristics and performance data
- 0 Trafficability, terrain, visibility, and weather data
- 0 NBC data

#### OUTPUT:

- O Computer printout of a complete time sequenced coroners report
- O Killer-victim scoreboard
- O Ammunition expenditures
- O Specific exchange ratio
- O Operational effectiveness ratio

#### MODEL LIMITATIONS:

- O Limited to 1000 dismounted infantry per side
- O Allowable terrain is limited by the dimensions of the open area used to house the 1/3000 scale terrain boards
- O The model is manpower intensive
- O The ratio of real time to game time is approximately 60:1

#### HARDWARE:

- O Type of Computer: WANG 2200 Minicomputer
- O Operating System: WANG Basic II
- O Peripheral Equipment:
  - Printer
  - Punched/mark sense card reader
  - Triple floppy disk drive
  - Winchester 10 Mbyte hard disk drive

#### SOFTWARE:

- O Programming Language: WANG Basic II
- O Documentation:
  - User manual
  - Programmers manual
  - Controller manual

#### GENERAL DATA:

##### Time requirements:

- O 6 weeks to acquire new data
- O 2 weeks to incorporate and validate new data
- O Approximately 7 days per game with dedicated minicomputer (dependent upon force size and structure)
- O 2 weeks to analyze and evaluate results

##### Security Classification:

- O Model - UNCLASSIFIED; Data - SECRET

Frequency of Use: Continuous

Users:

TRAC  
USAC&GSC  
Rand Corporation  
USAF Air Ground Operations School  
Engineer Studies Group  
Naval War College  
US Army Infantry School  
US Army Administration Center  
US Army, V Corps  
US Army Aviation School  
Israeli Defense Force

POINT OF CONTACT: US Army TRADOC Analysis Center (TRAC)  
Systems Analysis Directorate,  
White Sands Missile Range, NM 88002

KEYWORD LISTING: BATTLE, Wargame, Computer Assisted,  
Training, Analytical, Manual, Terrain Board.

CATALOG LISTING: Catalog of Wargaming and Military  
Simulation Models, 1986. Joint Analysis Directorate, OJCS.



TITLE: BGWG - Battlegroup Level War Game

MODEL CATEGORY: Conflict other than strategic nuclear/ground forces only - conventional conflict.

PROPONENT: MA4 Branch, RARDE, Fort Halstead, Sevenoaks, Kent, England

DEVELOPER: As Above

PURPOSE: The game is designed for the analysis of conventional warfare at battlegroup level and is used mainly for the assessment of direct fire weapons and the generation of methods of tactical use. The game is manual, with all decision making by the player, with computer assistance for calculation, assessment of weapon effects, etc., and record keeping.

GENERAL DESCRIPTION: This is a two-sided game in which most events are stochastic (e.g., weapon effects, target acquisition) though some seconds but with a resolution of 1 second within a slice. The smallest units represented are individual AFVs, individual ATGW and infantry fire teams and the game usually examines a battle between a Red regiment and a Blue battlegroup. The ratio of game time to real time varies with the battle being studied, but is usually between 1:50 and 1:150. Terrain is aggregated in 100m squares, but with specific features - buildings, woods, streams, roads - explicitly represented. The game can be played in any one of three modes:

1. Closed - with players from outside the BGWG staff playing in side rooms.
2. Open - with players from outside the BGWG staff playing on the control table with full view of both sides' pieces, and
3. "Absentee Commander" mode - with the Blue appreciation and plan being prepared by an officer outside the BGWG staff, but the subsequent gaming being played in the "open mode" with officers of the BGWG staff playing both Red and Blue. The last is the mode most often used nowadays.

INPUT:

- ☐ Weapon characteristics (accuracy, lethality, response time)
- ☐ Acquisition rules
- ☐ Movement rules
- ☐ ORBATs
- ☐ Scenario



OUTPUT: Raw data, with a very limited amount of manual processing. Facilities also exist for the preparation of target arrays and certain standard statistics related to exposures. Facilities can be provided in any series to collect and output data on any specific subject, appropriate to the level of the game.

PLANNED IMPROVEMENTS/MODIFICATIONS: Improvements include computer support of the gaming process, while leaving as much decisionmaking as possible to the players; improved representation of the terrain used for the intervisibility calculations in the computer, and constant updating of data as fresh or more reliable data becomes available.

MODEL LIMITATIONS:

- 0 A fairly crude level of command and control is now included and improvements are planned
- 0 The intervisibility model in use is slow and rather crude
- 0 The model of obscuration used is out of data and needs updating

HARDWARE: Computer: DATAPOINT 6600.

A three-dimensional terrain model has been used in the past, but nowadays the model used is usually one of the following, depending on the purpose and scale of a particular series:

- 0 Specially prepared, layer-tinted, large scale map
- 0 Large-scale aerial photographs
- 0 Photographically enlarged maps

SOFTWARE: The gaming programs are written in DATABUS and run on a DATAPOINT 6600. Consideration is being given to changing to BASIC. Little analysis is done as part of the game output, analysis in detail being left to the project officers of the projects in support of which the game is used.

GENERAL DATA: Time requirements:

- 0 Assuming that a scenario (provided by the project sponsor) and the necessary technical data have been provided and the necessary manual and computer "look-up" tables have been prepared, the time for one game to be set up (preparation of operational plans and deployment of pieces on the board) takes about 3-5 days.
- 0 Preparation of data for a new series may take 3-6 months, but this carried out in parallel with the preceding series

- O Play of an individual game takes 2-5 weeks and up to 8 games constitute a series, but exact timings and numbers depend on the purpose and detail of the series.
- O Detailed analysis of the results is not carried out by the game staff, but preparation of the output and deliver to project staff for analysis takes 2-4 weeks depending on the amount of detailed data collected during a series.

Security Classification: UNCLASSIFIED

Frequency of Use: Continuously

Users: MA4 Branch, RARDE

Miscellaneous: A continuous program of game enhancement and improvement is in hand, including:

- O Improved computer support of the gaming process, while leaving as much decision making as possible to the players.
- O Improved representation of the terrain used for the intervisibility calculations in the computer.
- O Constant up-dating of data as fresh or more reliable data becomes available.

POINT OF CONTACT: MA4 Branch, RARDE  
Fort Halstead  
Sevenoaks, Kent, England  
Telephone: Knockholt (0959) 32222

CATALOG LISTING: ABCA Catalog of War Games, Training Games, and Combat Simulations. Quadripartite Working Group on Army Operational Research, 1983. Prepared by Office of The Undersecretary of the Army (Operations Research).



TITLE: BIG STICK - Selection and Employment of Strategic Forces

MODEL CATEGORY: Strategic warfare - force structure

PROPONENT:

DEVELOPER: Air Command and Staff College (ACSC) and  
Educational Computer Science Branch (AU/ACDY)

PURPOSE: BIG STICK is used to assist students in applying general concepts used by intermediate level staff officers to plan, select and employ strategic forces. The team should have defined the mission objectives, the National Command Authority (NCA) guidance, prior to using the model.

DESCRIPTION: BIG STICK is an interactive, strategic war simulation. It involves the procurement of selected weapon systems, the deployment and targeting of these systems, and their ultimate employment. The exercise consists of two major phases--planning and war simulation. During the planning phase each team must formulate a written concept of operation based on National Command Authority (NCA) guidance. Teams must then select, deploy and target forces based on their concept of operations and in accordance with SALT constraints. The war simulation phase then follows with teams employing their forces based on their concept of operations. The war simulation consists of two campaigns - the Single Integrated Operation Plan (SIOP) campaign and the Restrike campaign. Teams must select the order in which they desire to execute their forces in both SIOP and Restrike. The computer will apply a Monte Carlo success/failure determination to specific weapon systems throughout the simulation. An added dimension to the exercise is the ability of a team to gather intelligence information about its opponent's forces. Intelligence collection and analysis can play a significant role in the outcome of the simulation.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: The file structure and programs currently support 80 teams (40 BLUE and 40 RED), 2 types of bomber aircraft, 2 types of fighter aircraft, 1 type of interceptor aircraft, 2 types of SLBMs, 3 types of ICBMs, 1 type of ABM, Civil Defense, 2 types of SAMs, 1 defense assessment satellite system, and 1 type of ASW. Two teams are the minimum necessary to conduct one simulation. Force

selection uses hypothetical SALT V agreements to set limitations on hardware procurement. Force deployment uses the physical sites as limiting factors (40 sites, 75 airfields, 4 sub ports, 6 subs).

HARDWARE:

Computer (OS): Honeywell 6060

Storage:

Peripherals:

SOFTWARE:

Programming Language: FORTRAN IV

Documentation: Operations Manual, ADM 171-2, Volume I;  
s' Manual - ACSC Student/Faculty Handouts;  
Maintenance Manual - extensive programmer  
notes.

GENERAL DATA:

Time Requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Classification:

Frequency of Use:

Users:

POINT OF CONTACT: (Proponent)

POINT OF CONTACT: (Developer)

KEYWORDS: Interactive, strategic war simulation, Monte Carlo

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: BLOCKBUSTER

MODEL CATEGORY: Conflict other than strategic nuclear/  
ground forces only. urban warfare

PROPONENT: Combined Arms Training Activity (CATA), Fort  
Leavenworth, KS 66027

DEVELOPER: As Above

PURPOSE: Train company commanders and platoon leaders to  
plan and conduct combined arms combat operations in and  
around urbanized terrain. Capabilities of vehicles, weapon  
systems, and personnel in a MOUT (Mounted Operations in  
Urban Terrain) environment.

GENERAL DESCRIPTION: A three-dimensional, manual battle  
simulation system designed for the purpose of conducting  
leader training in Military Operations on Urbanized Terrain  
(MOUT). Players employ miniature vehicles and dismounted  
units on a scaled terrain board according to an operations  
order and the rules of play. The rules are designed to  
accurately simulate the capabilities of vehicles, weapon  
systems and personnel. A 6-8 hour exercise will represent  
approximately 15-30 minutes of combat.

INPUT:

- O Order of Battle
- O Terrain and Weather

OUTPUT:

- O Combat resolutions are derived from the use of  
combat results tables (CRTs) based on weapon/unit  
employment and random number generators.
- O All reports are based upon these CRTs and are  
produced in accordance with units SOPs manually.

MODEL LIMITATIONS: Game time vs real time.

HARDWARE: Three-dimensional terrain board.

SOFTWARE: N/A

GENERAL DATA:

Time Requirements:

- O 3-5 hours player learning time
- O 8 hours playing time per cycle

Security classification: UNCLASSIFIED

Frequency of Use: User determined

Users: Active and Reserve Army Units

POINT OF CONTACT: Commander, Combined Arms Center  
ATTN: ATZL-TDD-SM  
Fort Leavenworth, KS 66027  
AUTOVON 552-3180/3395  
Commercial: (913) 684-3180/3395

KEYWORD LISTING: Interactive, strategic war simulation,  
Monte Carlo

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1982. Studies, Analysis and Gaming  
Agency, OJCS. (Now, Joint Analysis Directorate, OJCS).

**TITLE:** Brigade and Unit War Game Assisted Command Post Exercise

**MODEL CATEGORY:**

**PROPOSER:** War Games Section, Directorate of Land Operational Research (DLOR). Operational Research and Analysis Establishment (ORAE), Ottawa, Canada

**DEVELOPER:** As Above

**PURPOSE:** The game is designed to exercise unit and brigade command posts dynamically in virtually all operational aspects such as appreciations and plans, orders, intelligence, fire support coordination, staff duties, radio procedures, standing operating procedures, etc, and in administrative and logistic support procedures particularly as they relate to handling and replacement of personnel and vehicle casualties, replacement on major natures of ammunition, delivery of mines, etc.

**GENERAL DESCRIPTION:** This is a manual, closed, two-sided game, with split command levels, conducted in real time (real time/game time ratio 1:1) with groups of various compositions, within a divisional framework against a reinforced Warsaw Pact tank or motor rifle division and other elements of combined arms army and frontal aviation. In the force being exercised, all unit command posts and the brigade command post are deployed and functioning. Lower controllers from each unit are the respective sub-unit commanders (e.g., company, platoon, detachment, squadron, troop), forward observation officers, etc., covering all sub-units within the brigade. The control maps used are colour enlarged (1:10,000 or 1:12,000) and the level of detail is down to troop or platoon sized sub-units and individual equipments such as heavy anti-armor weapons, air defense weapons and helicopters. Rules, including deterministic and probabilistic, cover these areas: movement, both administrative and tactical in and out of contact; indirect fire including high explosive, illumination and smoke; detection; direct fire from tank guns, anti-tank guided weapons and machine guns; demolitions, craters and mines including the whole range of obstacle preparation and reduction, and minefield laying and breaching; air support including fixed wing reconnaissance and fighter ground attack; air defense; helicopters including observation, attack and transport operations.

**INPUT:**

- 0 Scenarios approved by Mobile Command Headquarters and Director General Intelligence Services.



INPUT: (cont)

- O Organizations and establishments approved by Mobile Command Headquarters.
- O War Game rules, as above, prepared and used by War Games Section of DLOR.

OUTPUT:

- O Assessment techniques are designed so that overall realistic outcomes can be arrived at quickly from which lower control intelligence and reports can be extracted relevant to the level of play. The information which lower controllers get, i.e., interaction outcomes within the dynamic battle framework, is that which the sub-unit commander, for example a company commander, would normally have available to him in actual operations and from which he would forward situation reports, states returns, situation assessments, battle damage, etc. These become the battle inputs to the exercised unit command posts for subsequent decisions and orders and also drive the logistics activities.

MODEL LIMITATIONS:

- O Cannot be conducted without DLOR War Game staff controller and supervising assessors.
- O Requires large control room staff.

HARDWARE:

- O 1:10,000 or 1:12,000 scale coloured maps for control board.

SOFTWARE:

- O At present manual assessments. Detailed logs are maintained by all lower controllers and command posts. In future it is planned to integrate computer support for some assessments.

STAFF:

- O DLOR War Game Staff of eleven Military officers, four NCOs and two scientific officers for controllers and supervising assessors. Three or four lower controllers/per unit being exercised. The brigade command post and all unit command posts within the brigade are deployed and operating.

GENERAL DATA:

Time requirements:

- O A lead time of about 6 months is required, but not full time work, commencing with scenario and setting, acquisition of maps, etc.
- O Preparation: Preparations by the brigade are as for a normal CPX but not with DLOR advice and assistance for control room set up and in operation. The formation or unit being exercised obtains/provides the large scale control room maps and prepares the detailed playing pieces in accordance with the force organizations. DLOR prepares/revises war game rules.
- O Play: The War Game portion of the exercise may last up to 30 hours of continuous operation.
- O Analysis: Analysis is not carried out but a post exercise critique is conducted immediately following play with the brigade commander, unit commanders, chief controller and designated other members of the war game staff.

Security classification: Restricted overall. Rules, which remain under DLOR control, are of various classifications.

Frequency of Use: On average, once annually.

Users: Brigades of Mobile Command.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1982. Studies, Analysis and Gaming Agency, OJCS. (Now, Joint Analysis Directorate, OJCS).

TITLE: Brigade Level War Game Assisted Command Post Exercise

MODEL CATEGORY:

PROPOSER: War Game Section, Directorate of Land Operational Research (DLOR), Operational Research and Analysis Establishment (ORAE), Ottawa, Canada.

DEVELOPER: As above.

PURPOSE: The game is designed to train and exercise staff college students in brigade staff work in a dynamic setting within the divisional battle.

GENERAL DESCRIPTION: This is a manual, closed, two-sided game, conducted in real time (real time/game time ratio 1:1) with a five-minute game time interval. The force being exercised is a brigade group in an assault water crossing. Two games are run concurrently with all lower controls and brigade command posts duplicated, but with a single higher control responding as division headquarters.

Brigade lower controllers represent unit commanding officers and forward observation officers. DLOR war game controllers carry out the sub-unit tactics in addition to discharging their controller duties.

Symbology, rules and assessment procedures are as for "Brigade and Unit War Game Assisted Command Post Exercise."

INPUT:

- 0 Scenario, organizations and establishments prepared by Canadian Land Forces Command and Staff College (CLFCSC) Kingston.

OUTPUT:

- 0 Assessment techniques are designed so that overall realistic outcomes can be arrived at quickly from lower control intelligence and reports can be extracted relevant to the level of play. The information which lower controllers get is that which a unit commander, e.g., battalion commander, normally would have available to him in actual operations and from which he would forward all operations reports and returns on the command net to the brigade command post.

MODEL LIMITATIONS:

- 0 Cannot be conducted without DLOR war game staff controllers and supervising assessors.

#### HARDWARE:

- O 1:12,500 scale colored maps for control board.

#### SOFTWARE:

- O Manual assessments.
- O Detailed logs are maintained by lower controllers, brigade command posts and higher controllers.

#### STAFF:

- O DLOR War Game staff of element military officers, four NCOs and one scientific officer as controllers and supervising assessors.
- O Each brigade lower control cell comprises six student representing units of the brigade.
- O Brigade command posts have all staff positions manned by students.

#### GENERAL DATA:

##### Time requirements:

- O Preparation: Given the scenario, preparation of operational plans by the players and realization of deployments on the control maps takes 1 - 2 days. Within this period DLOR war game staff brief and train lower controllers and assessors as necessary.
- O Play: The war game portion of the exercise usually is conducted from eight to nine hours.
- O Analysis: All detailed logs are retained and analyzed for staff lessons.

Security Classification: Unclassified overall. Rules, which remain under DLOR control, are various classifications.

Frequency of Use: Until 1981 there were two exercises annually. Game is now in abeyance.

Users: CLFCSC Kingston.

##### Miscellaneous:

- O Two games are run concurrently in each exercise.
- O It is intended that this war game will be mechanized

under the Staff Training Tactical Simulator (STS) project. Project definition has been completed and DLOR rules and assessment procedures are being computerized now.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1982. Studies, Analysis and Gaming Agency, OJCS. (Now, Joint Analysis Directorate, OJCS)



TITLE: CAMMS (Computer Assisted Map Maneuver Simulation)

MODEL CATEGORY: Conflict other than strategic nuclear/ground and sea forces.

PROPONENT: Battle Simulations Directorate, Combined Arms Training Activity, Fort Leavenworth, KS

DEVELOPER: As Above

PURPOSE: CAMMS is designed to exercise commanders and staffs at battalion and brigade level with normal combat support and combat service support elements in a simulated non-nuclear, combined arms combat environment against appropriate enemy forces. Command and control, staff coordination in a simulated combat environment.

GENERAL DESCRIPTION: CAMMS is a computer-assisted, two-sided, mixed, land and sea training, general war model.

INPUT:

- O Order of Battle
- O Terrain and Weather

OUTPUT:

- O Computer printouts stating combat results, consumption rates, remaining status
- O Special logistic or unit status reports available by special request retrieval

MODEL LIMITATIONS: Units played and logistic/admin items tracked limited to those which already exist within the data base.

HARDWARE:

- O Computer: General Electric (Mark III)
- O Storage: 500k words
- O Peripherals: TI Silent 700 (Model 745)

SOFTWARE:

- O Programming Language: FORTRAN
- O Documentation:

GENERAL DATA:

Time requirements: Data Base - several weeks to  
several months.  
Set up time - 8-12 hours player  
learning time  
Playing time per cycle: As  
desired

Security classification: UNCLASSIFIED  
Frequency of use: @ 75 times per year  
Users: USAR, NG, Active US Army units

POINT OF CONTACT: Commander, Combined Arms Training  
Activity  
ATTN: ATZL-TAS-S  
Fort Leavenworth, Kansas 66027  
AUTOVON 552-3189  
Commercial - (913) 684-3189

KEYWORD LISTING: Computer assisted, two sided, mixed, land  
and sea training, general war

CATALOG LISTING: Catalog of Wargaming and Military  
Simualtion Models, 1986. Joint Analysis Directorate, OJCS



TITLE: Canadian Land Force Operational War Game

MODEL CATEGORY: Conflict other than strategic nuclear/  
ground forces only - conventional conflict

PROPONENT: Directorate of Land Operational Research (DLOR),  
Operational Research and Analysis Establishment, (ORAE),  
National Defense Headquarters, Ottawa, Canada K1A 0K2

DEVELOPER: same

PURPOSE: Used to provide an objective and detailed  
simulation of war to tests concepts, tactics or doctrine.

GENERAL DESCRIPTION: This is a manual game with computer  
support. It normally uses training war game rules. Many  
rule areas are computer simulations but some are manual  
simulations; all rule areas can stand alone and games may  
be played with any or all of the rule areas active. These  
rules can be combined with the research rules since both  
are to the same scale and time. The game structure is  
extremely flexible and may be varied to suit the  
requirements of the exercise. It is normally an open game  
but either side may be closed if necessary. This model  
usually operates at battalion or brigade level but may  
operate at higher levels at a cost in playing time. The  
BLUE force normally is platoon size and the RED force is  
normally company size, but each force has many weapons  
individually played. Stochastic determination of most  
events is used. The model can be two-sided, controlled, or  
free play. Game play is frequently stopped or rewind in  
order to evaluate options. There are invisible five minute  
periods.

DATE IMPLEMENTED:

INPUT: DLOR supplies the package of weapons effects data  
and the skills and apparatus to control the game. The  
sponsor supplies the problem, setting, forces, and tactics  
that he wishes to explore.

OUTPUT: Different outcomes from discussion and judgement;  
some data are recorded in the computer.

LIMITATIONS:

HARDWARE:

Computer: LSI 11/23  
Operating System: LSI 11/23  
Storage:  
Peripheral Equipment:

SOFTWARE:

Programming Language: FLECS/FORTRAN  
Documentation Identification:  
Documentation Availability:

GENERAL DATA:

Time requirements: Data output analysis: 1 week.

Security classification: RESTRICTED.

Frequency of use: 1 or 2 times a year

POINTS OF CONTACT: DLOR, Dr. G. Armstrong, 613,992,5507.

KEYWORD LISTING: Manual, stochastic, two sided,  
controlled, free play.

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: Canadian Land Force Training War Game

MODEL CATEGORY: Conflict other than strategic nuclear/ground forces only - conventional conflict

PROPONENT: Directorate of Land Operational Research (DLOR), Operational Research and Analysis Establishment (ORAE), National Defense Headquarters, Ottawa, Ontario, Canada, KIA, OK2.

DEVELOPER: As Above

PURPOSE: To provide an objective and detailed simulation of warfare for the purpose of exercising, in real-time, headquarters staff.

GENERAL DESCRIPTION: Manual game with computer support. Many rule areas are computer simulations but some are manual simulations; all rule areas can stand alone and games may be played with any or all of the rule areas active. These rules can be combined with the research rules as both are to the same scale and time. The game structure is extremely flexible and may be carried to suit the requirements of the exercise. Closed game for Blue players. Can be and has been played at levels from brigade to corps and the Blue side with commensurate Red forces. Resolution varies from individual weapons to company groups - Blue force normally to platoon size, Red force to company size but each force has many weapons individually played. Stochastic determination of most events. Two-sided with Red and Blue players but, as Red is generally an exercise aid and is often somewhat controlled, Red headquarters are staffed at skeleton level and are part of the control room. Blue is free play. Indivisible five minute periods. All games at whatever level are real-time (1 to 1 real-time/game time ratio).

RULE AREAS COVERED: (C means computer simulation, M means manual simulation, M/C means mix with manual predominantly, C/M means mix with computer predominantly)

- O Air Defence (C)
- O Attack/Defence (C) - sole deterministic rule area, handles small mainly infantry actions
- O C3 (M)
- O Chemical Warfare
- O Detection (C/M)
- O Direct Fire (C)
- O Drones and RPVs (M)
- O Electronic Warfare (M) - newly developed and not completed

RULES AREAS COVERED: (cont)

- O Engineers (M/C) - covers all combat engineer activities including effects of conventional and scatterable minefields
- O Fixed Wing Air (C) ground attack and reconnaissance, does not include air to air battle
- O Helicopters (M) - observation, attack and heliborne assault
- O Indirect Fire (C)
- O Intelligence
- O Logistics and Resupply (M)
- O Movement (M)

INPUT: DLOR provides the package of weapon effects data, the RED force order of battle and the skills and apparatus required to control the game. The information or college being exercised determines the general direction of the exercise and the Blue force being played. Players make all plans, appropiations, and issue all orders.

OUTPUT: Very detailed information at low level on which the players must act. Some data is recorded in computer programs.

LIMITATIONS: Manpower requirements. Generally one lower controller and forward observing officer required per battalion group in play. Manpower requirements can be varied in command posts depending on what levels of play are desired - a corps level game provides enough data to exercise all battalion staffs, all division staffs and corps staff. It is rare that the exercised formation has enough people to take advantage of all the information generated by the game.

HARDWARE: LSI 11/23

SOFTWARE: About 176 FLECS/FORTRAN programs handle mostly rule area assessments. Small number of data recording and analysis programs with more being added constantly.

GENERAL DATA:

Time requirements: Set up time varies greatly with experience of those being exercised, the size of the game and how routine it is. Game play is real-time and most games last 2 to 2 1/2 nine hour days of continuous play to cover the same amount of game play.

Security classification: Game play and reports are generally Restricted unless real plans or deployments are used. The rules and simulations, which are under DLOR control, vary.

Frequency of use: Two division level games per year at Canadian Land Force Command and Staff College; two or three brigade level games per year at brigade groups. In past have played corps level games at Canadian Forces Command and Staff College.

Staff: DLOR has a staff of 11 scientists, 11 officers, 4 NCOs and 4 computer scientists. Depending on the size of the particular game, up to two thirds of the staff will be involved.

Users: Canadian Land Force Command and Staff College, Kingston, Ontario, Mobile Command Headquarters, St. Hubert, Quebec; 4 Canadian Mechanized Brigade Group, Lahr, West Germany.

POINT OF CONTACT: Dr. G.P. Armstrong  
Head Methodology Section  
DLOR, ORAE, NDHQ, Ottawa  
(6130 992-8507)

KEYWORD LISTING: Manual, stochastic, controlled, free play

CATALOG LISTING: ABCA Catalog of War Games, Training Games, and Combat Simulations, Quadripartite Working Group on Army Operational Research, 1983. Prepared by Office of the Deputy Undersecretary of the Army (Operations Research)

Catalog of Wargaming and Military  
Simulation Models, 1986. Joint Analysis Directorate,  
OJCS



TITLE: CATTS (Combined Arms Tactical Training Simulation)

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/air-ground - conventional conflict

PROPONENT: Combined Arms Training Activity, Fort Leavenworth, Kansas.

DEVELOPER: Combined Arms Training Activity

PURPOSE: Calculates intervisibility, weapon-to-target ranges and effects, status of personnel equipments, ammunition, fuel and cross-country movement. Train maneuver battalion and cavalry squadron command groups to attain and sustain ARTEP standards in the control and coordination of combined arms operations in a simulated environment against realistic enemy forces.

GENERAL DESCRIPTION: CATTS is a two-sided, time step, mixed land and air model designed for platoon/squad/brigade and battalion.

INPUT:

- O Firing rates
- O Kill probabilities
- O Mobility
- O Terrain and weather

OUTPUT: Minute-by-minute situation one line statements on CRTS. Also a TV monitor showing the map operation area with the up to date minute-by-minute locations of units, obstacles, control measures, firing lines, air missions, etc.

MODEL LIMITATIONS:

- O 100 units
- O CATTS can play in any terrain area after the input terrain files are preprocessed

HARDWARE:

- O Computer: XEROX E9
- O Operating System: 32 bit RBM
- O Minimum Storage Required: 1/2 megabyte
- O Peripheral Equipment: 270 megabyte of disk space, printer, 2 tapes and card reader

SOFTWARE:

- O Programming Language: FORTRAN, 10% Assembler

O Documentation: Math Model Users Manual, CATTS  
Trainer Programming Reprot, CATTS

GENERAL DATA:

Time requirements:

- O 6 months to acquire data base
- O 3 man-months to structure data in model input format
- O 3 hours to analyze output
- O 8 hours player learning time
- O 8 hours playing time per cycle
- O 60 seconds CPU time per cycle

Security Classification: UNCLASSIFIED

Frequency of use: Ten times per month

Users: 95 active, 33 reserve command groups have used the model.

Miscellaneous: ARTBASS is a mobile version of CATTS,

POINT OF CONTACT: LTC E. Childs, Combined Arms Training Activity, ATTN: ATZL-TAS-S, Fort Leavenworth, Kansas 66027  
AUTOVON 552-3189, Commercial (913) 684-3189

KEYWORD LISTING: Computerized, two sided, time step, mixed, land and air.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Model, 1986. Joint Analysis Directorate, OJCS.



TITLE: COMBATSIM

MODEL CATEGORY: Conflict other than strategic nuclear/  
conventional conflict

PROPONENT: U.S. Army Combined Arms Training Activity  
(CATA), Fort Leavenworth, KS

DEVELOPER:

PURPOSE: Designed to train and exercise battalion/brigade  
commanders and staff with normal CS and CSS elements in a  
simulated combat environment.

GENERAL DESCRIPTION: To be an upgrade of WACE and BABAS as  
a computer-assisted mixed land and sea training simulation.

DATE IMPLEMENTED: Prototype to be field tested, end of  
1987.

INPUT:

OUTPUT:

MODEL LIMITATIONS:

HARDWARE:

Computer (OS): microcomputer  
Memory:  
Storage:  
Peripherals:

SOFTWARE:

Programming Language:  
Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:  
Frequency of Use:  
Security classification:  
Users:  
Miscellaneous:

POINTS OF CONTACT: Battle Simulations Directorate, CATA,  
Ft. Leavenworth, KS

KEYWORD LISTING:

CATALOG LISTING: None



TITLE: COMMANDER - Tactical Air-Land Operations Model

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower, level/air-ground - conventional conflict.

PROONENT: TACLO, Fort Leavenworth, Kansas 66027

DEVELOPERS: O USAF Tactical Fighter Weapons Center  
O U.S. Army Combined Arms Combat Development Activity  
O C.A.C.I. Inc. - Federal

PURPOSE: COMMANDER is analysis tool for quantifying the effect of various combinations of tactical air weapons and support systems on the outcome of a dynamic, corps-level combined arms battle.

DESCRIPTION: COMMANDER consist of:

Tactical ground operations for both offensive and defensive units, including armor, mechanized, and artillery

Tactical air operations, including CAS, interdiction, and defense suppression

Tactical reconnaissance, including targeting, sensor configuration, and recce fusion

Air defense operations, including target acquisition, TEL allocation, missile and equipment availability, and damage assessment

Graphic battlefield displays of combat measures: location, momentum, and position certainty

Calculation routines for generating/updating measures of unit mass momentum and battlefield stress

User control over forces, including the capability to change tactical plans during the course of a game

COMMANDER was developed to provide a tool for joint studies of the total tactical air and ground environment. Two assumptions are fundamental to COMMANDER:

Major Army and Air Force combat (and combat-related) systems must be integrated into a single simulation to permit a satisfactory examination of any one (or combination) of them within a total tactical environment.

It is not currently possible to model the COMMANDER'S tactical decision-making process.

Thus, COMMANDER is a dynamic, interactive model of combined air/ground operations in which both the initial planning and the control of forces during the battle are reserved to human gamers.

Two developments, possibly unique to COMMANDER, permit the achievement of this objective:

Creation of simple combat measures that quickly convey what is occurring on the battlefield, and

Development of a user/program interface that permits gamer control of the combat units during the battle.

Each mission in COMMANDER is independent in that it can be made the focus of a study with its own parameters varied over a range of values while the others are held relatively stable. Thus, a reconnaissance study may investigate differences between "perceived" and enemy locations and "ground truth" for various levels of reconnaissance effort and aircraft/sensor combinations. A close air support study may vary tactical air allocation rules as well as the numbers and types of aircraft. Studies of ground combat can focus on the efforts of various tactics for fixed resources or the effects of variations in force mixes or force levels.

The operations interact in that the results of each form part of the input to the others. The disposition of the ground forces in simulated combat forms a realistic test bed for reconnaissance operations as well as targets for tactical air strikes. The tactical air allocation and strike operations, on the other hand, provide air support to the ground forces that is credible in both level and timing, while reconnaissance missions provide a "perceived" picture of the battlefield for ground and air tactical planning. The entire process is superimposed on a realistic communications model linking command and control centers with ground and air units.

COMMANDER is an extension of the hand-played war game philosophy. Tactical decisions are left to the players; bookkeeping and computational chores are given to the computer. The area of tactical decision-making belongs entirely to the players, and tactical planning for a COMMANDER game in many aspects parallels real world operational planning.

INPUT: Input requirements are extensive and consist of items such as scenario, system characteristics/effectiveness, air-order-of-battle, weather, and terrain. Because COMMANDER is written to allow deselection of mission areas, data input requirements vary with the study being desired.

OUTPUT: Complete time history with summaries for major mission areas such as air strike result, air defense effectiveness, and ground unit status. Interactively generated graphical results as desired.

LIMITATIONS: Ground Combat. The combat zones controlled by the ground combat units are represented by circles. Close combat occurs when opposing units overlap. There is no directional effect; at the level of individual units, an attack from the rear has the same effect as a frontal or side attack. There are, of course, ways in which the analyst may simulate the effects of frontal versus rear attacks (for example, by type changes, to allow the units to acquire new values for attrition rates and break points), but the effect is not automatically present for each engagement.

There is no distance effect. The killing rates do not depend on the relative positions of the units nor on the degree of penetration as represented by the size of the overlapping area. Thus, microtactics (that is, the movements of men and equipment within the area occupied by the basic game unit) cannot be simulated.

The appropriate level for the basic unit played in a given game depends, of course, on the study objective of the game. However, because attrition is deterministic and uniform across a ground unit, the model is probably not suitable for basic units smaller than companies, and the model's best use is at the battalion to division level. While it could handle units larger than the division, its treatment of individual air attacks and specific environment features would be wasted (that is, unnecessarily detailed). Other operations related to real warfare but not modeled explicitly in COMMANDER include:

Logistics (maintenance, resupply, stockpiling)

C3

Intelligence operations, espionage, deception

Special warfare (irregular, urban, CB, nuclear)

Political, psychological aspects

Air Attacks: Weather effects may change the target detection probabilities. There is no weather effect on the aircraft flight path nor on the survival probability computed for the aircraft. Other operations crucial to air strikes not included explicitly in COMMANDER are:

Air-air combat

Logistics, resupply of fuel and weapons

Airfield attacks

Reconnaissance: Reconnaissance flights are simulated in detail, with the recce aircraft flying along prespecified path legs, at designated altitudes, and with sensor on-off conditions specified by the players. The aircraft are assumed to travel so fast, relative to the ground units, that no movement of ground units takes place during the flight. This does not mean, of course, that moving ground units are perceived as stationary. Any moving ground unit is potentially detectable by the appropriate sensors. A recce flight may be designated as having a data-link and, if destroyed, is assumed to have transmitted its information to the ground for all flight legs up to the one on which it was lost. All information is lost from a destroyed recce aircraft if no data-link is present.

HARDWARE:

- O Computer: CDC Cyber 74, VAX 11/780
- O Operating System: NOS/BE.
- O Minimum Storage: Approximately 200,000 octal words. Varies with the scenario and modules used.
- O Pheripheral Equipment: Tektronix 4014 (if graphics desired).

SOFTWARE:

- O Programming Language: SIMSCRIPT II.5
- O Documentation: Extensive user and programmer documentation available.

GENERAL DATA:

Time requirements: General estimates of study timing and manpower requirements are difficult because both are especially sensitive to each study's scope and objectives. Rough guidelines for study planning are given below:

Time requirements: (cont)

	<u>MAJOR STUDY EFFORT</u>	<u>MINOR STUDY EFFORT</u>
<u>Personnel:</u>		
Study Director	1	1
Computer Program Operations/ Data Entry Clerks	2-3	1-2
Analysts	4-6	2-4
Programmers	2-4	0
<u>Timing:</u>		
Initial Data Preparation	2 months	0
Program Runs	3-4 months	1-2 months
Data Analysts	3-4 months	1-2 months

A major study effort is one for which the entire database must be developed. Interactive runs are used for:

- 0 Inputting the reconnaissance missions (which are stored permanently for later program runs)
- 0 Inputting the air strike missions
- 0 Checking the ground war operations for consistency and "reasonableness."

When the combat results for the case are acceptable, then batch runs with parameter variations required by the study are submitted. Obtaining the runs and analyzing the results can proceed simultaneously during the 2-6 months allotted for the study.

In addition to the development of a complete data base, a major study effort may call for program modifications, requiring two to four programmers during the study period.

A minor study is one that may use a data base already developed in the course of another study and will not require program changes. A team of two to four analysts can obtain and analyze results over a two- to four-month period.

These numbers are obviously intended to be representative only, since the actual requirements of any given study are highly sensitive to the study's particular characteristics as well as to the resources available for it.

Security classification: UNCLASSIFIED. Data bases are normally secret.

POINT OF CONTACT: TACLO  
Fort Leavenworth, KS 66027

C.A.C.I. Inc., -Federal  
2727 Camino Del Rio S.  
Suite 319  
San Diego, CA 92108  
1-714-299-0960

KEYWORDS:

CATALOG LISTING: Catalog of Wargaming and Military  
Simulation Models, 1986. Joint Analysis Directorate, OJCS



TITLE: COMM/EW Evaluation System

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/air-ground - conventional/nuclear.

PROPONENT: US Army Materiel Command (USAMC), CM/CCM Directorate, Adelphi, Maryland 20783

DEVELOPER: DoD ECAC, Annapolis, MD

PURPOSE: The COMM/EW Evaluation System is intended for use in conjunction with existing war games to allow players to incorporate COMM/EW into the war games. The system is being designed modularly to allow the incorporation of COMM/EW modules directly into war games being developed and modified.

GENERAL DESCRIPTION: The COMM/EW Evaluation System is an interactive, two-sided game in which events are deterministic. The system models units to the level of the individual pieces of equipment (e.g., communications radio, jammer, DF, etc.). The performance characteristics of each piece of equipment may either be specified by the players or be drawn from a data base of existing equipment. The location of each piece of equipment is specified using universal coordinates; actual terrain is modeled using a computerized topographic data base. The system may be either time or event driven. Players can make changes in equipment types, characteristics or location between events or time slices. The system then evaluates the status (i.e., operation, effects of jamming, effects of interception) of each communication link being played. The status of each link may be displayed in either abbreviated form (GO/NO GO) or full form (J/S ration, S/N ration, etc.)

DATE IMPLEMENTED:

INPUT: Equipment characteristics (if not standard equipment data files), equipment locations/scenario, communications links/nets to be analyzed.

OUTPUT: Link/net status and link/net communications characteristics (J/S, S/N, etc.).

LIMITATIONS: Equipment location or characteristics changes must be transferred from the war game to this system between plays.

HARDWARE:

Type computer (OS): PDP 11 (can easily be adapted to other similar minicomputers as well as most mainframe computers.

Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: FORTRAN  
Documentation:

GENERAL DATA:

Time requirements: Data base preparation - 1/2 day.  
CPU time per cycle -  
Playing time - several minutes  
Data out put analysis - performed  
interactively between plays.

Security classification: UNCLASSIFIED (software),  
CONFIDENTIAL (scenario), characteristics may also be  
classified.

Frequency of use: As required

Users: USAMC/CM/CCM Directorate, DoD ECAC, wargamers

POINTS OF CONTACT: Mr. J. Scaepanski 202-394-3160

KEYWORD LISTING: COMM, EW, interactive, two sided,  
deterministic.

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: CORDIVEM - Corps/Division Evaluation Model

MODEL CATEGORY:

PROPONENT: Combined Arms Operations Research Activity,  
Fort Leavenworth, KS

DEVELOPER: As Above

PURPOSE: CORDIVEM is a computerized division/corps level multi-purpose model. As a systemic simulation model it may be used as an analytical tool in the design/evaluation of force structure tradeoff analysis and other combat development problems. As a gamer-assisted interactive war game it will be used to develop TRADOC standard scenarios. In addition, a training model will evolve from the interactive version to support the Command and General Staff College at Fort Leavenworth.

GENERAL DESCRIPTION: CORDIVEM is a two-sided deterministic model involving joint Army-Air Force operations on the Air Land battlefield. Its flexibility of use allows for a systemic simulation mode for addressing combat development problems and as a gamer-assisted computerized wargame. This model is primarily designed for division/corps level application with a manipulation range of company through Army. Level of model unit resolution is normally a maneuver battalion with a manipulation range of company through regiment. CORDIVEM is an event sequenced model which will be capable of executing at or near real time, dependent upon model application and unit resolution. Primary solution techniques include COMANEW utilizing Lanchester equations along with probabilistic algorithms. The CORDIVEM modeling effort is currently in a developmental stage. It represents part of a DS directed hierarchial model development plan instituted in 1980 and completed in 1984.

INPUT:

- 0 Unit TOE and Echelonment
- 0 Terrain, weather
- 0 Leathality data
- 0 Command & Control data
- 0 Mobility
- 0 Firing rates
- 0 Item level performance characteristics

OUTPUT: CORDIVEM output is a combination of graphical displays and computer printout in the form of specialized reports tailored to provide detailed information on military functions and processes modeled. Reports include:

- O Unit Status
- O Intelligence & Sensor Reports
- O Killer/Victim Matrices
- O Comprehensive Artillery Reports
- O Reports on Movement, Resupply, Air Missions, etc.

MODEL LIMITATIONS:

- O Currently not available for use
- O Undocumented
- O Hardware specific, not easily transportable

HARDWARE:

- O Computer: DEC VAX-11/780
- O Operating System: VMS
- O Minimum Storage Required: 2mb memory, 200mb disk
- O Peripheral Equipment: RAMTEK 9300

SOFTWARE:

- O Programming Language: FORTRAN IV, SIMSCRIPT
- O Documentation: TBP

GENERAL DATA:

Time requirements:

- O To acquire Data Base: 3 man-months
- O To structure Data in Model Input Format: 2 weeks
- O To Analyze Output: 1 man-month
- O Player Learning Time: 2 weeks
- O Playing Time per Cycle: 8 hours
- O CPU Time per Cycle: 2 hours

Security Classification: UNCLASSIFIED. With input data, SECRET.

Frequency of use: Continual

Users: CASAA, Fort Leavenworth, KS

MISCELLANEOUS: CORDIVEM will be linked to CASTFOREM in a battalion level model and to FORCEM, a theater level model. The linkage will consist of passing scenario descriptive information up to FORCEM and receiving detailed direct fire attrition data from the higher resolution model, CASTFOREM.

POINT OF CONTACT: CAORA  
Attn: (ATOR-CAS)  
Fort Leavenworth, KS 66027  
Telephone: (913) 684-3245

KEYWORD LISTING: Computerized; Analytical; Simulation

CATALOG LISTING: Catalog of Wargaming and Military  
Simulation Models, 1982. Studies, Analysis and Gaming  
Agency, OJCS. (Now, Joint Analysis Directorate, OJCS)



TITLE: CRES - Command Readiness Exercise System

MODEL CATEGORY: Air warfare, joint warfare, general war.

PROPONENT: US Air Force Air University, Maxwell AFB, AL

DEVELOPER: US Air Force Air University, Maxwell AFB, AL

PURPOSE: Provide an environment in which Airpower problems can be experienced; practice integration of battlefield tasks; apply current concepts, doctrines and strategies; accomplish various scenarios, forces and systems.

GENERAL DESCRIPTION: CRES is a simulation system being developed for use at the Air University. It is being developed in three phases; Phase 1 - direct support to professional military education at AU; Phase 2 - Joint Service warfare capability to be developed; Phase 3 - Operational warfare simulated and exercised.

DATE IMPLEMENTED: Under development. Now in Phase 1.

INPUT:

OUTPUT:

LIMITATIONS:

HARDWARE:

Type computer:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:

Frequency of Use:  
Users:

POINTS OF CONTACT: CRES PMO, AU, Maxwell AFB, AL.

KEYWORD LISTING:

CATALOG LISTING: None





**TITLE:** DAMSEL - Transportation Network Analysis  
(Interactive Data Management and Selection)

**MODEL CATEGORY:** Transportation and mobility

**PROPONENT:** U.S. Army Logistics Center, Ft. Lee, VA 23801

**DEVELOPER:** The BDM Corporation

**PURPOSE:** DAMSEL is an automated system for transportation network analysis. This interactive, user-oriented system provides the capability for analysts to rapidly conduct shortest path analyses to route personnel, equipment and supplies. The analyst also has the capability to evaluate the effectiveness of various interdiction policies by blocking links in the network and determining the resulting transportation delays and alternative routings. The DAMSEL system was designed to support simulation models of the Army Worldwide Logistics System (MAWLOGS) family including LOGATAK I, LOGATAK II and MACATAK. DAMSEL supports these models by automatically providing regionalized subsets to transportation network data which can be input directly to the models.

**GENERAL DESCRIPTION:** DAMSEL is a computerized, interactive of batch, transportation network analysis methodology. The transportation network is stored in a data base management system for ease of access and change, and to preserve the data for multiple users and application. The DAMSEL network is also presented in a multi-volume set of Data Base Atlas'. Each Atlas volume includes a complete set of maps with overlays delineating the existing DAMSEL network elements on each page and a computer printout of the DAMSEL data values on the facing page. The DAMSEL data base currently encompasses most of the Central European transportation network, and Mideast and Northeast Asia regions.

**DATE IMPLEMENTED:**

**INPUT:** Selection: Quadrant, sectors desired, modes desired (highway, rail, sea, air, inland waterway, pipeline, transshipment); model input format desired. Interactive Analyses: origin, destination, shipment size, mode restrictions, network blockage. Data Base Expansion: terminal number, link numbers, quadrant, mode, city, country, location, capacity, docks, vulnerability, rebuild time, type of link, route number, length, rate of travel, location of vulnerable points.

OUTPUT: Selection: MAWLOGS tape file with all data base elements for region and MAWLOGS report for transportation network selected; interactions can only be represented by linking DAMSEL to one of the family of MAWLOGS simulation models specified above.

LIMITATIONS: Transportation network analysis is limited to regions contained in the data base management system. Dynamic, time phased traffic interactions can only be represented by linking DAMSEL to one of the family of MAWLOGS simulation models specified above.

HARDWARE:

Type computer: CDC 6000 (NOS/BE), CDC CYBER 176 (NOS)  
Operating system:  
Storage requirements: 120k (octal)  
Peripherals:

SOFTWARE:

Programming language: FORTRAN, System 2000 DBMS  
Documentation: DAMSEL DBMS Users' Guide; DAMSEL Programmers' Guide; DAMSEL Transportation Network Atlas, The BDM Corporation, 1981

GENERAL DATA:

Time requirements: Data Base: preparation - 3 months  
(to expand data base), 1 day (structure data)  
Security classification:  
Frequency of use: 50 times per year

Users: U.S. Army Logistics Center, The BDM Corporation, Defense Nuclear Agency

POINTS OF CONTACT: (Proponent) Mr. S. Cockrell

KEYWORD LISTING: Analytical, logistical, land, air, sea, computerized, transportation, nodes, throughput.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: DBM - Division Battle Model

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/air-ground - conventional.

PROPONENT: TRADOC Analysis Center (TRAC), White Sands Missile Range, NM 88002

DEVELOPER: General Research Corporation (GRC)

GENERAL DESCRIPTION: DBM is a computer assisted, manual wargame designed to support studies of the performance of weapons, organizations, and tactics of a division-size force. The model permits the play of tactical aircraft, airmobile operation, and general support artillery as well as ground combat operations. The manual portion consists of decision making, determination of events, and time sequencing while the computer provides attrition assessment, reports battle results, and keeps records. The game is played on a tactical map with unit resolution to the company/battalion level. Play may be in open, semi-closed or closed modes.

INPUT:

- O Weapon effects data
- O Unit organization
- O Tactical decisions

OUTPUT: Combat attrition

MODEL LIMITATIONS:

- O Requires tactically proficient gamers
- O Requires an extensive library of high resolution simulations for ground combat attrition calculation

HARDWARE:

- O Computer: Digital
- O Operating system: Any with some modification
- O Storage: 55K
- O Peripheral Equipment: Line printer, tape drive

SOFTWARE:

- O Programming Language: FORTRAN IV
- O Limited Documentation is available.

GENERAL DATA:

Time requirements:

- O Set up time dependent on high resolution history availability - approximately two man-months minimum.

- O Game play: 1/2 to 1/8 real time, depending on gamer skill. Two to four games may be played simultaneously
- O Computer Time: Six minutes per two hours of combat play (UNIVAC 1108)

Security classification: Dependent on input weapon effects data. Basic model is UNCLASSIFIED.

Frequency of use: Approximately 100 times per study.

Users:

- O TRAC
- O USCAA

KEYWORDS: Computer assisted, semi closed, closed, open.

POINT OF CONTACT: Director  
US Army TRADOC Analysis Command  
ATTN: ATTA-TGS (Mr. Keith Thorp)  
White Sands Missile Range, NM 88002  
Telephone: AUTOVON 258-1881/3149

Miscellaneous: Model is linked through COMANEX to a high resolution simulation such as CARMONETTE.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: Division Level War Game Assisted Command Post Exercise

MODEL CATEGORY:

PROPONENT: War Game Section, Directorate of Land Operational Research (DLOR). Operational Research and Analysis Establishedment (ORAE), Ottawa, Canada.

DEVELOPER: As Above

PURPOSE: The game is designed to train and exercise staff college students in brigade and divisional staff work in a dynamic setting within the corps battle.

GENERAL DESCRIPTION: This is a manual, closed, two-sided game, with split command levels, conducted in real time (real time/game time ratio 1:1) with a five-minute game time interval. The force being exercised is a division within a corps framework in mobile defense against a combined arms army. Division HQ and three brigade HQ command posts are established with students filling all appointments.

Brigade lower controllers represent unit commanding officers and forward observation officers. DLOR war game controllers carry out the sub-unit tactics in addition to discharging their controller duties.

Symbology, rules and assessment procedures are as for "Brigade and Unit War Game Assisted Command Post Exercise."

INPUT:

- 0 Scenarios, organizations and establishments prepared by Canadian Land Forces Command and Staff College (CLFCSC) Kingston and Canadian Forces Command and Staff College (CFCSC) Toronto.
- 0 War Game Rules and assessment procedures prepared and used by War Game Section of DLOR.

OUTPUT:

- 0 Assessment techniques are designed so that overall realistic outcomes can be arrived at quickly from which lower control intelligence and reports can be extracted relevant to the level of play. The information which lower controllers get is that which a unit commander, e.g., battalion commander, would normally have available to him in actual operations and from which he would forward all operations reports and returns on the command post.

Similarly, artillery nets function between forward observation officers, regimental command posts and divisional artillery staffs. The logistics activities are driven as a result of battle activity and interactions.

MODEL LIMITATIONS:

- o Cannot be conducted without DLOR War Game staff controllers and supervising assessors.
- o Required additional augmentation for some higher control staff positions.
- o Large control room staff.

HARDWARE:

- o 1:12,500 scale colored maps for control board.

SOFTWARE:

- o Nil. Manual assessments. Detailed logs are maintained by all lower controllers, higher controllers and command posts.

STAFF:

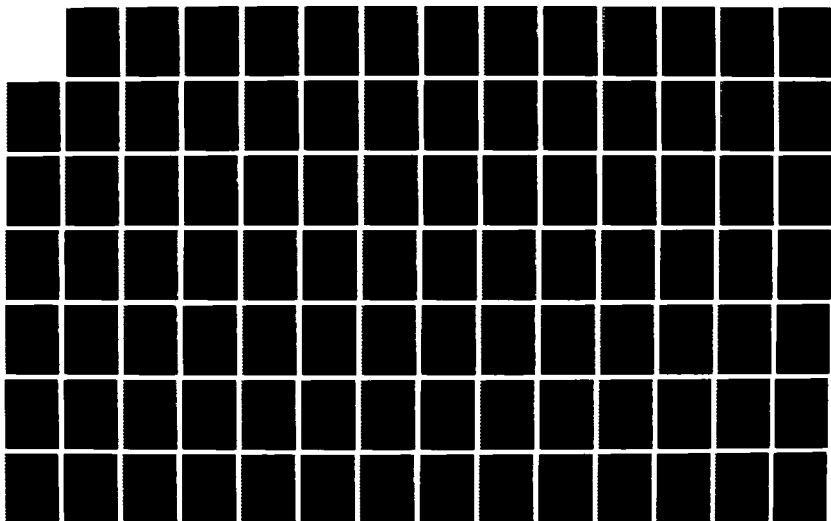
- o DLOR war game staff of eleven military officers, four NCOs and two scientific officers as controllers and supervising assessors.
- o Each brigade lower control cell comprises six students representing units of the brigade.
- o Higher control is manned by a mix of Directing Staff, students and augmentees.
- o Brigade and division command posts have all staff positions manned by students.

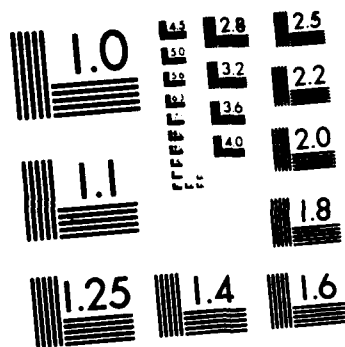
GENERAL DATA:

Time requirements:

- o Preparation: Given the scenario, preparation of operational plans by the players and realization of deployments on the control map takes two to three days. Within this period DLOR war game staff brief and train lower controllers and assessors as necessary.
- o Play: The war game portion of the exercise usually is conducted for three days.
- o Analysis: All detailed logs are retained and analyzed for staff lessons within the Staff College.

AD-A192 101 CATALOG OF SIMULATION MODELS AND WARGAMES USED FOR UNIT 2/3  
AND LEADER TRAINING SECOND EDITION(U) TRAINING AND  
PERFORMANCE DATA CENTER ORLANDO FL E P GRANT JAN 87  
UNCLASSIFIED TPDC-86-004 F/8 12/5 NL





MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963 A



Security classification: UNCLASSIFIED overall. Rules, which remain under DLOR control, are of various classifications.

Frequency of use: Two exercises annually.

Users: CLFCSC Toronto.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1982. Studies, Analysis and Gaming Agency, OJCS. (Now, Joint Analysis Directorate, OJCS)



TITLE: DIVLEV - Division Level Wargame Model

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/air-ground forces - conventional conflict

PROPONENT: US Army Material Systems Analysis Activity, (USAMSAA), Aberdeen Proving Grounds, MD 21005-5071

DEVELOPER: As Above

PURPOSE: DIVLEV is a computer assisted, analytic, general wargame model which moves units, determines engagements and attrition, and updates unit strengths and supply levels. The DIVLEV model was developed to produce realistic tactical situation, including unit movements and attrition as a function of time. These situations are used in the evaluation of various materials and evaluations of weapon mixes and tactics. The methodology has been calibrated through comparisons with historical battle results.

GENERAL DESCRIPTION: DIVLEV is two-sided and deterministic, involving both land and air forces. The resolution of units that the players control is usually determined by the objective of the study and the tactics the players intend to use. Generally, the player - controlled units are of battalion or company size. DIVLEV is structured so that players have complete control of the organization for combat. They can use either standard TO&E units or task forces, and these units can be at either full or reduced strength. The players give orders and optional orders to each unit which include the route the unit is to take, the unopposed speed at which it is to move, the dimensions of the unit (whether deployed or in column), and the direction the unit is to face upon reaching its destination. Optional orders are activated when player-described conditions are met. Once an optional order is activated, the old order is discarded and the unit starts on its new assignment. DIVLEV contains a representation of suppression by both direct and indirect-fire weapons, a treatment of system reliability, and a representation of close air support. Suppression effects are based on combat experience. Target acquisition is played explicitly.

Once sets of players-generated contingency orders have been developed, the model can be used as a combat simulation. In this mode, the same player inputs are used, but different weapon characteristics, artillery target priorities, sensor mix, artillery attack criteria, and so forth can be input. This feature allows for the parametric evaluation of weapon and support systems, doctrine, and trade-offs among them in terms of force success.

DATE IMPLEMENTED: 1972

INPUT:

- O Tactical scenario to include initial situation and unit objectives
- O Weapon data to include range, rate of fire, crew size, weight of ammunition, and range dependent kill rates.
- O Tactical scenario to include initial situation and unit objectives
- O Terrain statistics, wooded and urban areas
- O Unit data to include position, equipment strength and maneuver instructions
- O Vehicle speeds

OUTPUT:

- O Plots showing unit position
- O Unit data to include position, strength, and interaction with opposing units
- O Killer-victim scoreboard
- O The time interval for any of the output can be specified by input codes

MODEL LIMITATIONS:

- O Digitized evaluation data are not included
- O Logistics are kept on the entire unit and not the individual weapon
- O Non-nuclear

HARDWARE:

- O Computer: CDC 7600
- O Operating System: Score 2.1.5
- O Minimum Storage Required: 150K
- O Peripheral Equipment: Disc storage, CALCOMP plotter

GENERAL DATA:

Time requirements:

- O Preparation: Initial scenario development -  
for a division vs Army situation:  
4 man-months  
Weapon-Terrain data: 3 man-months
- O Play: 4-8 weeks for 40 hours of combat
- O Analysis: 1 week per variation from initial game  
1 month after last variation for  
summaries

These estimates are for a totally new situation. If any of these required data have been used in previous studies, the preparation time is reduced accordingly.

Security classification: UNCLASSIFIED

Frequency of use: Continuously

Users: AMSAA, Combined Forces Command/Operational Analysis Group (Korea)

PLANNED IMPROVEMENTS/MODIFICATIONS: Long range plans include interactive processing and the development of a command and control module. DIVLEV is being rewritten in FORTRAN 77 in a structured format for the VAX 11/780.

CATALOG LISTING: ABCA Catalog of War Games, Training Games, and Combat Simulations. Quadripartite Working Group on Army Operational Research, 1983. Prepared by Office of the Deputy Undersecretary of the Army (Operations Research)

Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS



TITLE: DIVWAG - Division War Game Model

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/air-ground forces - conventional conflict

PROPONENT: Combined Arms Combat Developments Activity, Fort Leavenworth, KS

DEVELOPER: Combat Developments Research Office, Computer Sciences Corporation

PURPOSE: DIVWAG is a player-assisted, analytical, general war model. Based upon game order to the units, the model performs the firepower, mobility, target acquisition, and combat service support functions. The chief focus of concern is the evaluation of a division-sized force at a level of resolution which will permit determination of the impact on force effectiveness of changes in mixes of weapons and other systems. In addition, the model considers available logistical support and other combat and combat services support functions, to include Army and Air Force air support.

GENERAL DESCRIPTION: DIVWAG is a two-sided model having both deterministic and stochastic features. Land and air forces are simulated. The model is primarily designed to consider units ranging in size from a maneuver battalion task force to a division. The lower limit of this range may be maneuver battalion to task force to a division. The lower limit of this range may be manipulated to consider a maneuver company team. Simulated time is treated on an event store basis. The ratio of game time to real time is 1:3. Probability and analytical algorithms are the primary solution techniques used.

INPUT:

- 0 Terrain and weather data
- 0 Weapons and equipment characteristics
- 0 Weapons effects data
- 0 Decision tables for establishing priorities for fires and levels of attack
- 0 Consumption rates
- 0 Unit TO&Es
- 0 Task organization

OUTPUT:

- 0 For each period: A set of computer printout reports which provide the information essential for accomplishing the period turnaround
- 0 For a game: Raw data requiring analysis in summary, tabular form

#### MODEL LIMITATIONS:

- O Does not portray dismounted riflemen in ground combat
- O Communications are not simulated
- O Total number of units for both sides is 1,000
- O 200 items of equipment are played for each side

#### HARDWARE:

- O Computer: CDC 6500
- O Operating system: SCOPE 3.4.2
- O Minimum storage required: 3 million words
- O Peripheral Equipment: 1 disc drive, 3 tape drives, card reader and printer

#### SOFTWARE:

- O Programming language: FORTRAN and COMPASS
- O Documentation published in 1972, updated 1973. A User's Manual, Technical Manual and a Programmer's Manual are provided with documentation.

#### GENERAL DATA:

##### Time requirements:

- O 3 months to acquire data base
- O 15 man-months to structure data in model format
- O 60 calendar days playing time for 48 hours of continuous combat
- O 1.7 hours CPU time per two hours of combat
- O 6 months learning time for players

Security classification: CLASSIFIED

Users: NA

Miscellaneous: DIVWAG superceded DIVTAG II

POINT OF CONTACT: COL S. Friend, 913-684-3957 (AV 552-3957)

KEYWORD LISTING: Player assisted, analytical, general war, two sided, deterministic, stochastic, land and air, event store, probability

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS



TITLE: DROMEDARY - Systems Analysis Exercise

MODEL CATEGORY: Economic

PROPONENT:

DEVELOPER: Air Command and Staff College (ACSC) and  
Educational Computer Science Branch (AU/ACDY)

PURPOSE: DROMEDARY allows students to translate the concepts and processes of systems/economic analysis into a practical approach for solving complex cost-effectiveness problems. In addition, it serves to familiarize students with the usefulness of computer assistance in solving resource allocation problems.

GENERAL DESCRIPTION: This interactive model is an analytical tool used to construct a fictitious, but realistic, operation system known as DROMEDARY. The DROMEDARY system, which employs an airborne system using EC-909 vehicle, is one of three alternatives presented to improve the National Emergency Command and Control (NECC) system. Its mission is to provide immediate emergency command and control communications with appropriate civilian and military elements. As analysts, the users must prepare an estimate of the cost effectiveness of the EC-909 airborne package as a possible alternative to be employed in the NECC system.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: No refueling should be considered or introduced into the exercise; no mission aborts or takeoff unless a nuclear attack occurs; all aircraft that are airborne are "safe" from nuclear attacks; only non-airborne aircraft are destroyable; all missions will be completed unless the aircraft is caught on the ground by a nuclear attack--thus, the worst case to be considered is the one in which a relief aircraft is destroyed by nuclear attack at the moment of takeoff.

HARDWARE:

Type computer: Honeywell 606  
Operating system:  
Storage requirements:  
Peripherals:

**SOFTWARE:**

Programming language: FORTRAN IV  
Documentation: Operators Manual - ADYM 171-4, Volume I;  
Users Manual - ACSC Student/Faculty Handouts; Maintenance  
Manual.

**GENERAL DATA:**

Time requirements:  
Security classification:  
Frequency of use:  
Users:

**POINTS OF CONTACT:**

**KEYWORD LISTING:** Analytical, command and control, NECC

**CATALOG LISTING:** Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: DUNN-KEMPF

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground - conventional

PROPONENT: Battle Simulations Directorate, Combined Arms Training Activity, Fort Leavenworth, Kansas

DEVELOPER: As Above

PURPOSE: Train company/team level leaders in the planning and conduct of combined arms combat operations in a simulated combat environment. Evaluation of and training in internal unit SOPs.

GENERAL DESCRIPTION: A three-dimensional, manual battle simulation designed to train leaders in combined arms operations. Players employ scaled miniatures on a terrain board in accordance with unit orders and SOPs.

INPUT: Order of battle, firing rates, terrain and weather.

OUTPUT: Combat resolution derived from CRTs manually and oral reports rendered by players to training elements.

MODEL LIMITATIONS: Game time versus real time ratio.

HARDWARE: Training Device 17-98 (DUNN-KEMPF)

SOFTWARE: N/A

GENERAL DATA:

Time requirements:

- O 2-3 hours player learning time
- O 8 hours playing time per cycle

Security classification: UNCLASSIFIED

Frequency of use: As desired by unit.

Users: A wide variety of Army units, active and reserve.

POINT OF CONTACT: Commander, USACAC  
ATTN: ATZL-TAS  
Ft Leavenworth, Kansas 66027  
AUTOVON 552-318-3180  
Commercial: (913) 684-3180

KEYWORD LISTING: Manual battle simulation,  
three-dimensional, combined arms operations, training  
system

CATALOG LISTING: Catalog of Wargaming and Military  
Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: DWG - Divisional War Game

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: MA2 Branch, RARDE, Sevenoaks, Kent

DEVELOPER: RARDE with support from LOGICA Ltd

PURPOSE: Manual, computer-assisted War Game for Land Warfare Studies.

GENERAL DESCRIPTION: Closed, two-sided with split command levels. Terrain aggregated in 500m squares. Units in general aggregated at platoon (Blue), company (Red) with important units down to single vehicles. Event sequenced. Flow of orders and information simulated in Command/Control/Communications model with appropriate delays.

INPUT: Scenarios for Combat Development and Defence Intelligence Staffs. Equipment performance data from MOD R&D Estabs. Unit performance data - from analysis. Terrain data - from maps.

OUTPUT:

- 0 Battle historical and tactical impressions - from military players and control staff
- 0 Game occurrence diary with all events recorded
- 0 Analytical data is then extracted from the occurrence diary using special purpose software

MODEL LIMITATIONS: Numbers of individual units less than 1500 each side. Rate of play typically 6-12 minutes real time to 1 minute game time.

HARDWARE:

- 0 Type Computer: VAX 11/780
- 0 Operating System: VMS
- 0 Minimum Storage Required: 1 1/2 Mbytes Mos; 3 x 67 Mbytes discs
- 0 Peripheral Equipment: 8 VDU; 8 printers; 1 line printer; 2 x Magnetic tape drivers

SOFTWARE:

- 0 Programming Language: VAX FORTRAN (PLUS)
- 0 Documentation Availability: Users Guide and Programmers' Manual

**STAFF:**

- O Control: 3 Military officers
- O Players: 2 Military officers (permanent Red and Blue commanders)  
12 Military officers (visitors - variable depending on staff functions explicitly played)
- O Support Staff: 6 clerks; 4 map markers
- O Analysts: Variable depending on projects under evaluation

**GENERAL DATA:**

Time requirements Prepared Data Base: 5 days

Security classification: Up to SECRET

Frequency of use: Continuous. Six games each of four weeks duration per year. These games are independent but any number can be run sequentially to give continuous combat simulation.

Users: RARDE

**POINT OF CONTACT:** Knockholt (0959) 32222  
Ext. 2370

**KEYWORD LISTING:** Manual, computer assisted, land warfare studies, closed, two sided, C3, event sequenced.

**CATALOG LISTING:** Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: FAST STICK II - Tactical Air Forces Employment Feasibility

MODEL CATEGORY: Conflict other than strategic nuclear/air combat - many on many.

PROPONENT:

DEVELOPER: Air Command and Staff College (ACSC) and Educational Computer Science Branch (AU/ACDY)

PURPOSE: The Air Command and Staff College (ACSC) uses the FAST STICK II exercise as a capstone to the General Purposes Forces and Joint Operation Planning System (JOPS) phases of the military employment instruction. The exercise provides participants with the opportunity to apply the concepts, roles, and missions of tactical air forces through the use of notional forces. In addition, participants can apply quantitative techniques to determine weapon effectiveness and select strike flight composition to accomplish a desired damage expectancy.

GENERAL DESCRIPTION: FAST STICK II is a computer-assisted, theater, air war simulation. The exercise is set in a hypothetical scenario in which US military forces help defend a friendly nation. FAST STICK II simulates the first 72 hours of the air campaign conducted by the US air forces. Exercise participants function as members of their current plans and current operations branches of a Tactical Air Control Center (TACC). Participants plan and conduct operations and targets priorities. The FAST STICK II model simulates a complete mission sortie from take off to landing. Flights can be refueled on ingress and egress. All recce and strike sorties are subject to area as well as point defenses such as interceptors, AA, and SAMs. Notional aircraft types include F, A, RF, WILD WEASEL (WW), and Electronic Warfare (EWA). Strike and recce aircraft (F, A, RF) have a multiple pass or multiple target capability. F aircraft may be used in a combat air patrol (CAP) or air defense (AD) role as well as a strike role. EWA and /wws may be used to decrease the attrition probability of strike aircraft. EWA will counter area electronic defense systems and WWs will seek out and damage or destroy target point defenses such as SAMs and AAA. All aircraft (strike, recce, support) are subject to attrition by enemy defenses. Tactical air requests (TARs) are randomly generated during the exercise. These TARs simulate immediate close air support requests from ground combat units. TARs can be responded to by either diverting an airborne flight or by scrambling alert aircraft. Enemy counter attacks are randomly generated. Counterattack defenses include both active and passive measures. Air defense alert aircraft may be scrambled to engage enemy

aircraft. Other in-commission aircraft may be vertically dispersed in order to decrease attrition probabilities. Maintenance functions are simulated by subjecting all aircraft to an in-commission check. Aircraft are either in commission or out of commission for 8 hours or out of commission for 24 hours. The model includes weather parameters that affect combat operations. Weather forecasts, based on the weather parameters in the model, have been prepared for use during the exercise. All of the necessary tables and matrices for ordnance probability of damage, flight times, and aircraft weapons load configuration are included in the exercise users manual. All the necessary forms, charts, and maps are included in the exercise package and examples of their have been included in the users manual. The FAST STICK II simulation can handle from 1 to 99 teams on a time-sharing system. All flight scenario information is immediately provided to the team via the computer terminal. In addition, a batch print program provides faculty instructor with a summary of the team's daily flying activities.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: Users who do not precede the FAST STICK II exercise with the ACSC's JOPS sequence will have to provide additional information, target region intelligence file, and time to FAST STICK II participants.

HARDWARE:

Type computer: Honeywell 6060 or 6000, WANG, IBM 360.  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: FORTRAN /IV.  
Documentation: Operators Manual, Users Manual - ACSC  
Student/Faculty handouts, Maintenance Manual; extensive  
programmer notes available.

GENERAL DATA:

Time requirements: Data Base -  
Playing time - 20 contact hours over  
5 calendar days  
CPU time per cycle -  
Data output analysis - 4 to 6 hours



Security classification:

Frequency of use:

Users: Air Command and Staff College, Venezuela Air  
Command and Staff College, USREDCOM, USMC (MCDEC)  
Amphibious Warfare School

POINTS OF CONTACT:

KEYWORD LISTING: Computer assisted, air campaign, weapon  
effectiveness

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.



TITLE: FIRST BATTLE

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: Battle Simulation Directorate, Combined Arms Training Activity, Fort Leavenworth, Kansas.

DEVELOPER: Same as Proponent

PURPOSE: A division level manual, scenario and terrain independent battle simulation designed to exercise division command groups, coordinating staff along with brigade command groups and selected battalions in a simulated combat environment against a free play opposing force. Internal SOPs can be evaluated under simulated combat conditions.

GENERAL DESCRIPTION: A manual, scenario and terrain independent battle simulation which models complete resolution at company/terrain level and is designed to exercise the division command group while also being capable of exercising selected battalions, brigade staffs and commanders and including the corps assets.

INPUT:

- O Order of Battle
- O Firing Rates
- O Terrain and Weather

OUTPUT:

- O Combat results generated manually using combat results tables
- O Reports rendered manually to player elements by player/controller personnel

MODEL LIMITATIONS: Player controller personnel costs.

HARDWARE: GTA 71-2-3

SOFTWARE: N/A

GENERAL DATA:

Time requirements:

- O 2-3 days player learning time
- O Playing time per cycle - Unit Desires

Security classification: UNCLASSIFIED

Frequency of use: When the unit desires

Users: Army brigade and division-level staffs.

Miscellaneous: Field Observations Booklet available.

POINT OF CONTACT: Commander, USA CATA  
ATTN: ATZL-TAS  
Fort Leavenworth, Kansas 66027  
AUTOVON 552-3180  
Commercial: (913) 682-3180

KEYWORD LISTING: Conflict other than strategic nuclear,  
corps or lower level/ground forces only - conventional

CATALOG LISTING: Catalog of Wargaming and Military  
Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: FIRST BATTLE - BATTALION THROUGH CORPS

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: Combined Arms Training Activity, Ft Leavenworth, KS

DEVELOPER: As Above

PURPOSE: To train unit commanders and staffs in the control and coordination of combined arms operations in a simulated environment against a realistic enemy force. Evaluates unit tactical SOP.

GENERAL DESCRIPTION: FIRST BATTLE B-C will replace WAR EAGLE, FIRST BATTLE, and PEGASUS. It is designed to provide a training tool for transition into Army 86. It is a manual battle simulation based upon a single methodology which can exercise commanders and staffs in a realistic CPX mode from Battalion through Corps level.

INPUT: Unit operations order, plans and tactics.

OUTPUT: Battlefield results and movement on the game board.

LIMITATIONS: Player controller personnel costs.

HARDWARE: NA

SOFTWARE: GTA-71-2-4, available through Army Training Aids Support Centers.

STAFF:

	BN	BDE	DIV	CORPS
PLAYER/ CONTROLLER:	25(+)	30(+)	100(+)	340(+)
CONTROLLERS:	8	10(+)	12(+)	16(+)

GENERAL DATA:

Time requirements:

O Training Required: Open Mode - 8 hours (+)  
Closed and CPX Mode -  
24 hours (+)

O Playing Time: TBD by unit; recommend 36 hours (+)

Security classification: Unclassified

Frequency of use: User determined.

Users: Army unit staff groups from battalion level through Corps

Miscellaneous: Manning requirements for any level of play depend upon the scenario. Automated version under development.

POINT OF CONTACT: Combined Arms Training Activity,  
ATTN: ATZL-TAS  
Ft. Leavenworth, KS 66027  
Autovon 552-3180  
Commercial (913) 682-3180

KEYWORD LISTING:

CATALOG LISTING: U.S. Army Training Support Center  
Bulletin Number 84-1. U.S. Army Training Support Center,  
Ft. Eustis, VA.

TITLE: FIRST FORAY

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: Headquarters New Zealand Land Forces (HQ NZLF), Takapuna Auckland, New Zealand

DEVELOPER: As Above

PURPOSE: The game is designed to exercise Divisional, Brigade and, to a limited degree, unit command posts in operational staff procedures, battlefield reporting, production and use of combat intelligence and some administrative and logistic staff procedures.

GENERAL DESCRIPTION: FIRST FORAY is a manual, two-sided game, with the capacity for one or two levels of command to be exercised. Played in real time with a five-minute game time interval. The force being exercised is either an infantry division or infantry brigade with supporting arms and services. The enemy force is based on Warsaw Pact organizations, tactical doctrine and weapon characteristics. In the force being exercised, lower controls (representing unit command posts if unit level exercise) conduct the battle on the games board, with intervening command posts deployed and functioning. The games board is enlargement (1:10,000) of standard topographical map and level of detail is down to troop or platoon sized sub-units and individual weapons i.e., ATGW, AD weapons, helicopters etc. Rules, produced in handbook form, used with dice-roll, cover these areas: close combat; direct fire from armored vehicles, machine guns, anti-tank guided weapons; indirect fire support including high explosive, smoke and illumination; obstacles; air defense weapons; movement both tactical and non-tactical; observation and target acquisition devices; air support including reconnaissance and fighter ground attack; helicopters including observation, attack and tactical transport.

INPUT: Scenarios approved by exercise controller.  
Organizations approved by exercise controller.  
(Blue forces based on NZP86 NZ Army Staff Notebook; Red forces based in NZ Army Intelligence Center Enemy Handbook)  
Also input from FIRST FORAY Handbook

OUTPUT: Conclusion of each combat resolution gives lower controllers sufficient realistic information to pass to exercised command posts to initiate appropriate staff action--limited tactical appreciations are required to react to outcome of combat--logistic and administrative activities are then generated.

#### LIMITATIONS:

- O Requires large control staff
- O Has limited tactical training application

#### HARDWARE:

- O 1:10,000 scale enlargements of topographical maps for games board
- O Tokens to represent maneuver elements and weapons

#### SOFTWARE:

- O Various unit record sheets detailed in handbook
- O Detailed logs kept by lower controllers and command posts
- O Future plans include computer support to reduce control manning

#### STAFF:

- O Board Controllers to adjudicate between Blue and Red Lower Controllers
- O Lower Controllers to represent sub-units (company or platoon level)
- O Higher controllers usually combined with exercise control/coordination cell

#### GENERAL DATA:

##### Time requirement:

- O Lead Time: sufficient for map enlargement, concurrent activity to confirm scenario and exercise ORBATS (not full time)
- O Preparation times for exercising Headquarters are as for normal Command and Signals exercise
- O Plan: War game portion of exercise may last up to 5 days of continuous operations
- O Analysis: not carried out but post exercise critique and debrief conducted immediately after exercise with commanders and staffs

Security classification: RESTRICTED

Frequency of use: On average, one divisional exercise, three brigade exercises annually

Users: HQ NZLF, formations of NZLF

#### POINT OF CONTACT:



KEYWORD LISTING: Manual, two sided.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS

ABCA Catalog of War Games, Training Games, and Combat Simulations. Quadripartite Working Group on Army Operational Research, 1983. Prepared by Office of the Deputy Undersecretary of the Army (Operations Research)

TITLE: IBGTT - Interim Battle Group Tactical Trainer

MODEL CATEGORY: Naval warfare

PROPONENT: Naval Ocean Systems Center (NOSC), San Diego

DEVELOPER: NOSC Code 83, System Development Corporation

PURPOSE: To give tactical support for senior naval officers in force-level tactical decision-making and management of command and control, and to provide a means for simulation of Navy at-sea systems/subsystems to analyze their performance and interactions under warfare conditions.

GENERAL DESCRIPTION: The simulation is two-sided (with an umpire-like function), deterministic, discrete event, and interactive (man-in-the-loop). It can simulate naval forces varying from a single unit to a battle force. Program elements are defined individually and selectively for platforms, sensors, weapons, and communications. The simulation supports multiple aspects of naval warfare: AAW, ASE, ASUW, STW, EW and TACNUC (offline). The simulation is supported by 15 detailed physical process models in areas of environment, kinematics, engagement and damage, communications, and sensors. There are eight user work stations.

INPUT: Platforms, sensors, weapons, communications, command, and control, environment, scenario.

OUTPUT: For each workstation, geo-tactical color display, force status boards, hard-copy printouts. For post-exercise analysis, hard copy printout of portions of exercise reconstruction

MODEL LIMITATIONS: No AMW or MW. No communications counter-measures. Restricted surveillance satellite operations. Limited aggregation of force commands.

HARDWARE:

Computer - Dual VAX 11/780 and 1 VAX 11/750.  
Minimum Storage - 20 Mb for full-up system; 3 Mb  
for stand-alone version

SOFTWARE: FORTRAN 77 AND RATFOR NOTE: System is currently running on software release NWISS 1.0.

Documentation: System Architecture Plan, Type A and B1 specs, Progress Performance Specification, Progress Design Specification, Data Base Design Specification in accordance with MIL-STD-1649. Additionally, User's Guide, and Analyst's Guide.

GENERAL DATA:

Time requirements:

1. Scenario Prep - 1 week
2. Simulation time can be set from 1/6 real time to 4 times real time
3. Elapsed time dependent on scenario and objectives; average is 2-3 days

Security classification: UNCLASSIFIED. Data is SECRET.

Frequency of use: 2-3 times/month

Users: COMNAVCENT, COMACTRAGRUPAC

Miscellaneous: System capable of remote operations if adequate secure communications circuit (9600 baud, full-duplex) is available.

POINT OF CONTACT: Naval Ocean Systems Center (Code 8302)  
San Diego, CA 92152  
Telephone (619) 225-6338/6902

KEYWORD LISTING:

CATALOG LISTING: Catalog of NOSC Simulation Capabilities and Models. Naval Ocean Systems Center, San Diego, CA.

TITLE: ICOR - Integrated Corps Model

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level

PROPONENT: Defense Nuclear Agency (NAWE)

DEVELOPER: The BDM Corporation, 7915 Jones Branch Rd, Mclean, VA 22101

PURPOSE: ICOR is a computerized, analytical, general war, corps-level model used to support issues relating to force structure, weapons effectiveness, and mission analysis. ICOR uses a top-down structured modeling approach. Its modular characteristic allow the user to adopt the model to meet specific requirements. The most commonly used level of aggregation is battalion unit level with terrain representation to a resolution of 3.5 km. The model is concerned with ground and air-ground combat involving aircraft, tanks, infantry fighting vehicles, artillery equipment, anti-tank guided missiles, and various other assets.

GENERAL DESCRIPTION: In the ICOR model, units are not restricted to artificial corridors, as is the case with sector models, but can maneuver as the simulation dictates. They are constrained only by terrain, opposing forces, and orders. ICOR also does not require the user to impose an artificial partition on the battlefield. All elements of a combined arms operation are included. Maneuver and fire support units are represented as explicit entities with inherent decisionmaking capabilities. Within each of the individual combat units, each major weapon type is explicitly represented. There is no aggregation of weapons. Indirect fire weapons engage by firing battery, platoon, or any user defined volleys against acquired targets. Aircraft, including attack helicopters, acquire and engage targets using expected kills per sortie for precision munitions or fractional damage for area munitions. Explicit representation of individual air defense systems, with relatively detailed ground-to-air engagements, provide the source of aircraft attrition. ICOR plays explicit intelligence collection by imaging of the effects of terrain and weather on unit fire and maneuver. A key capability of the model is its "man-in-the-loop" (MITL) feature, which allows actual battle staff gamers to interact with the model and make command decisions.

DATE IMPLEMENTED:

INPUT: Order of battle; firing rates; kill probabilities; weapon system characteristics; mobility; operational doctrine; behavior, and transitions; terrain and weather; artillery taskings; EW system tasking; and air support tasking.

OUTPUT: Position and status reports; strength-loss reports; air attack results; air defense kills; direct fire weapon kills; sensor status; intel reports; line of contact reports; artillery statistics; mass/momentum; graphics such as terrain, unit displays, hex grid, SIGINT displays, mass momentum vectors, and line of combat displays.

LIMITATIONS: Requires that higher level (corps level) command decisionmaking be provided manually.

HARDWARE:

Type computer: CDC CYBER 176 (NOS/BE or NOS) - ICOR-I and II  
Operating system:  
Storage requirements: 22k octal 60 bit words  
Peripherals: card reader or alphanumeric input terminal, line printer, Tektronix 4014 (ICOR-II)

SOFTWARE:

Programming language: FORTRAN  
Documentation: ICOR Program Design Language, ICOR Users Manual

GENERAL DATA:

Time requirements: Data base - preparation - 6 months  
Playing time - 1 to 6 hours  
CPU time per cycle - several seconds to several hours  
Data output analysis - hours to several days  
Security classification: UNCLASSIFIED  
Frequency of use: 2 or 3 times a year  
Users: CACDA, DNA, USAFACAS, TCATA

POINTS OF CONTACT: Proponent, Mr. F. Lynch, 703-827-7780

KEYWORD LISTING: Corps level, conventional, nuclear, ground, air-ground combat, computerized, two-sided.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: JANUS

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground combat - conventional and nuclear.

PROPONENT: US Army TRADOC Analysis Center, (TRAC), White Sands Missile Range, NM 88002-4000

DEVELOPER: Lawrence Livermore National Laboratory, Livermore, CA.

PURPOSE: JANUS is a computerized interactive ground combat simulation model utilizing dynamic graphics representation. The JANUS code provides a neutral battlefield environment with detailed treatment of nuclear, chemical, and conventional military systems and digitized terrain. Players, in a competitive near real time simulated battle, make tactics and system employment decisions using interactive graphics based upon continuous presentation of a map-like display and on-call status reports. The model is used to evaluate nuclear weapon concepts and the interaction of the principal maneuver elements under conventional/chemical; nuclear conditions. The model provides insights useful in analysis or training.

GENERAL DESCRIPTION: JANUS is a two-sided stochastic ground force model designed for conflict at up to Blue Brigade versus Red Division force levels. The model focuses on individual fighting system engagements and assessments, with aggregation capability up to company size elements. The JANUS code is event sequenced, runs in near real time, and uses probabilistic solution technique within an overall Monte Carlo simulation approach.

INPUT:

- O Numbers and types of units
- O Number of nuclear rounds
- O Weapon systems/specific system characteristics (including basic loads, ranges, reload rates, movement speeds, ordnance velocity and system size)
- O Terrain (digitized tapes)
- O Engineer obstacle availability
- O Visibility assumptions
- O Combat objectives
- O Interactively (during simulation); unit movement orders and indirect fire targeting

#### OUTPUT:

- O Continuous color display of units, weapons effects and individual weapon engagements
- O Unit status reports - on-call from terminal scope or in hard copy at preset intervals:
  - Attrition by unit
  - Unit locations
  - Unit ammunition status
  - Nuclear incapacitation and other affects
  - Unit speed and direction
  - Summary of attrition by side - unit systems killed vs weapons causing kills
- O Videotape, 35mm slide, 16mm movie (optional)

#### MODEL LIMITATIONS:

- O Air support not modeled
- O Logistics limited to basic loads
- O Forces not able to dismount
- O Scope currently limited to Blue Brigade (+) vs. Red Division (+)
- O C3I not explicitly modeled
- O Sensors limited to visual acquisition
- O Static engineer obstacles only

#### HARDWARE:

- O Computer: VAX 11/780 (VMS) and Ramteck 9400.  
Supporting equipment (graph tablets, high resolution monitors, function box, terminals)

#### GENERAL DATA:

##### Time requirements:

- O To acquire Data Base: 1 man-day - 1 man-month, depending on data
- O To Structure Data in Model Input Format: 1-7 man days in general
- O To Analyze Output: Less than 1 day
- O Player Learning Time: 1-2 days
- O Playing Time per Cycle: 4-6 hours per battle

Security classification: SECRET      RESTRICTED DATA

Frequency of use: Daily

Users: Lawrence Livermore National Laboratory, US Army, USAIS, USAARMS, ADEA, US Air Force

POINT OF CONTACT: Mr. C. Kirby, AV 258-4618  
Mr. Benson. AV 258-4298

PLANNED IMPROVEMENTS/MODIFICATION: Use of a distributed network with multiple player stations to model Corps level conflict, including Corps, Division and multiple Brigade Headquarters with C31. Air support and ammunition logistics resupply explicitly modeled and controlled by players

KEYWORD LISTING: Computerized, interactive, nuclear, stochastic, chemical, or conventional military systems, two sided, ground force, event sequenced; probabilistic.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS



TITLE: JANUS/T

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/air-ground forces - conventional, nuclear, and/or chemical conflict.

PROPONENT: US Army TRADOC Analysis Center, (TRAC), White Sands Missile Range, NM 88002-4000

DEVELOPER: Lawrence Livermore National Laboratory (LLNL)

PURPOSE: JANUS/T is two-sided, interactive, near real time wargame developed to explore the relationships of combat and tactical processes. Players interactively make decisions of doctrine and tactics, deploying forces, determining unit objectives, planning and executing artillery fires (including laser designated projectiles, nuclear munitions, smoke, and chemicals), employ air assets and plan and execute barriers.

GENERAL DESCRIPTION: JANUS/T has demonstrated the ability to support studies to the level of reinforced task force versus three regiments, each with supporting assets. The size of the digitized terrain is selectable. Resolution is down to the individual system (which can be individual fire team or soldier if necessary). Conventional direct fire is automatic and dependent on line-of-sight, probability of acquisition (from the NVEOL acquisition model), response time, reload rates, range, and posture of firer and radiation. Nuclear effects include thermal, blast and prompt, and delayed radiation. The player has the ability to mount and dismount forces on vehicles. The game also supports detailed play of COPPERHEAD and ground-launched HELLFIRE.

INPUT: JANUS/T preprocessors have been developed to use the BATTLE direct fire data base.

OUTPUT: Summary status reports, system reports, and artillery mission reports which detail losses are available to each side during the game. Unit positions are recorded continuously during the game.

LIMITATIONS: Conventional phenomena such as dust and vehicular smoke are not currently played, radar sensors are not played explicitly, illumination rounds are not modeled, and the area effects of direct fire weapons are not assessed; chemical phenomena such as persistent chemicals, chemical alarms, and performance degradation due to MOPP are not yet incorporated although methods are being developed; nuclear phenomena such as dazzle, induced radiation fallout, and EMP effects are not currently assessed.

HARDWARE: Computer - VAX 11/780  
Storage - 4 Megabytes (CPU), 500 Mbytes (disk storage)  
Peripherals - 1 disk drive, 1 UNIBUS 4LA 120, 8 VT100 terminals, 1 line printer.

SOFTWARE:

- O Programming Language: FORTRAN DI3000 Software Package is currently required.

GENERAL DATA:

Time requirements:

- O Player learning time - 1 hour
- O Playing time per cycle - less than 8 hours per game

Security classification: UNCLASSIFIED

Frequency of use: Expected 2 to 3 studies per year with up to 10 scenarios per study and 3 to 4 games per scenario.

Users: Lawrence Livermore National Laboratory, TRADOC Analysis Center (TRAC)

POINT OF CONTACT: AUTOVON: 258-4618/4298

KEYWORD LISTING: War game; combat simulation; conventional, chemical or nuclear combat; two sided; interactive.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS.

TITLE: JESS - Joint Exercise Support System

MODEL CATEGORY: Joint warfare

PROPOSER: US Readiness Command, MacDill AFB, FL 33608

DEVELOPER: Jet Propulsion Laboratory, 4800 Oak Grove Dr.,  
Pasadena, CA 91109

PURPOSE: JESS is a computerized battle simulation system. It is designed to drive a Joint Readiness Exercise (JRX), which is a joint task force command post exercise (CPX). The heart of the system is an interactive computer model of field operations. Simulated battle results from JESS are used in real time to provide realistic data to train commanders and their staffs in JRXs. The system replaces the manual battle boards used previously.

GENERAL DESCRIPTION: A CPX using JESS includes three interacting groups: Blue force controllers, command post personnel undergoing training, and opposing force (OPFOR) controllers. The Blue force controllers operate the Blue workstations, interfacing with the combat simulation via the workstation input devices, printers and graphics. The controllers also interface with the command post via organic communications. The controllers act as subordinate unit commanders, translate (when necessary) and enter command post orders into the combat simulation, and interpret and communicate combat simulation outcomes back to the command post. The ability of the controller to portray a combat environment through his reports and responses to orders provides a key element in the realism perceived by the command post.

The command post units staff their respective tactical operations centers, execute operations plans, and respond to contingencies by communicating with Blue force controllers, who represent their subordinate units.

Under direction of the Senior Controller, the OPFOR controllers also interact with the combat simulation. They maneuver and control Red forces to provide active opposition the the Blue forces in a way that contributes to the training objective of the exercise.

The entire exercise is coordinated by the Senior Controller, who monitors and controls the flow of battle so that exercise objectives are met. He is supported by technical controllers who have direct access to the combat simulation software that allows them a measure of intervention over simulation outcomes. Further control over the simulation depends on controller discipline and role-playing ability.

JESS may operate via the DECnet data network consisting of one or more Ethernet-based LANs which may be linked through WAN techniques to permit world-wide communications.

DATE IMPLEMENTED: Interim IOC, October 1985. Complete IOC, November 1986. Further enhancements scheduled thru 1990.

INPUT:

OUTPUT:

LIMITATIONS:

HARDWARE:

Type computer: 1 ea. VAX 8600 and 13 ea. MicroVax II microcomputers

Operating system: VMS

Storage requirements: 20 Mbytes

Peripherals:

SOFTWARE:

Programming language: SIMSCRIPT II.5 and C.

Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:

Frequency of Use:

Users: HQ I Corps, USREDCOM

POINTS OF CONTACT: Proponent: 813-830-4393; Developer: 818-577-9388

KEYWORD LISTING:

CATALOG LISTING: None as yet.

TITLE: JTLS - Joint Theater Level Simulation

MODEL CATEGORY: Conflict other than strategic nuclear/theater

PROPONENT: JAD, OJCS, The Pentagon, Washington DC 20301

DEVELOPER: (original) JPL, Pasadena, CA  
(modifications) SYSCON Corp, 1000 Thomas Jefferson St.,  
NW, Washington, DC, 20007

PURPOSE: JTLS is a computerized, analytical model used to assist planners in developing and evaluating theater level operation plans (OPLANS).

GENERAL DESCRIPTION: The current JTLS model features a heterogenous Lanchester equation attrition model. It consists of four interrelated programs including a Start/Restart program, a Scenario Preparation Program (SPP) which builds the data base, a Combat Events Program (CEP) which is the warfare simulation model, and a Model Interface Program (MIP) which transmits user graphics capability. A postprocessor is available to assist users in analyzing output data from the model. Ground, tactical air, naval forces, and intelligence and logistic functions are represented.

DATE IMPLEMENTED: June 1986

INPUT: Military equipment and unit performance, capabilities, and effectiveness; terrain and weather; model parameters such as attrition coefficients.

OUTPUT: Current situation reports for units; operations summaries; air status, air route status, and logistics status reports for a force or unit; and intelligence reports at the national, strategic, and tactical level.

LIMITATIONS:

HARDWARE:

Type computer: VAX 8600 (VMS)  
Operating system:  
Memory: Estimated to be 16 Mbytes (virtual)  
Storage requirements: 10 Mbytes  
Peripherals: 4 to 28 VT 100 compatible terminals, 3 Graphover G9500s, 1 video monitor, 1 digipad, 1 video disc player, and 1 to 3 printers

SOFTWARE:

Programming language: SIMSCRIPT II.5, C, CQUEL,,  
FORTRAN, MACRO-11 Assembly  
Documentation: "Joint Theater Level Simulation (JTLS)  
Executive Overview"

GENERAL DATA:

Time requirements: Data Base: 6 to 8 months  
CPU Time per Cycle:  
Data Output Analysis: 2 months

Security classification:

Frequency of use: As required

Users: Joint Analysis Directorate of the Organization  
of the Joint Chiefs of Staff, the unified and specifies  
commands involved with the Modern Aids to Planning Program,  
as well as the Army War College, Warrior Preparation  
Center, Air War College, Naval War College, National  
Defense University

POINTS OF CONTACT: (Proponent) LtCol J. Morra,  
202-694-8311, AV695-8311  
(Developer) Mr. D. d'Alelio (SYSCON), 202-342-4000

KEYWORD LISTING: Theater level operations, contingency  
plan evaluation, logistics intelligence, joint forces.

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: KORA

MODEL CATEGORY: Operational Tactical Planning Training,  
Division Level & Brow

PROPOSER: IABG/SOP Ottobrunn, Germany

DEVELOPER: As Above

PURPOSE: KORA is used for Force Structure and Weapons Mix Studies as well as a useful tool in support of operational and tactical planning. The model addresses logistics and maintenance considerations of the fighting force. The model has been used for training of general staff officers.

GENERAL DESCRIPTION: KORA is a computerized, two-sided, deterministic, time-step simulation that models air-land, non-nuclear combat. Primarily designed for company versus battalion combat. The model can handle brigade vs division level engagements.

INPUT:

- O Attrition coefficients
- O Artillery effectiveness data
- O Consumption rates
- O Army and Air Force commands (orders)

OUTPUT: Printout and plot with raw game data. Statistics data (using an evaluation routine) selective outputs for maneuver troops, artillery, anti-tank, helicopter, and Air Force, consisting of: Event list, status and availability data.

MODEL LIMITATIONS: Two military unit levels between command level and assessment level.

HARDWARE:

- O Computer: CDC CYBER 175
- O Operating System: NOS
- O Minimum Storage Required: 145,000 Octal words (COBIT)
- O Peripheral Equipment: Plotter

SOFTWARE:

- O Programming Language: FORTRAN IV
- O Documentation: Available printed in German

GENERAL DATA:

Time requirements:

- O To acquire Data Base: 1-3 months
- O To structure Data in Model Input Format: 1 man-month
- O Player Learning Time: 1/2 month
- O Playing Time per Cycle: 3 cycles (up to 12 hours conflict time) per day
- O CPU Time per Cycle: 300 CPU seconds (90 min battle)

Security classification: CONFIDENTIAL, RESTRICTED

Users: IABG/SOP, Fuhrungsakademie der Bundeswehr,  
Hamburg

POINT OF CONTACT: IABG  
Abteilung SOP  
Einsteinstrasse  
D 8012 Ottobrunn, Germany

KEYWORD LISTING:

CATALOG LISTING: Catalog of Wargaming and Military  
Simulation Models, 1982. Studies, Analysis and Gaming  
Agency, OJCS. (Now, Joint Analysis Directorate, OJCS)



TITLE: LANDING FORCE

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/air-ground forces - conventional, nuclear, and/or chemical conflict; also amphibious warfare

PROPONENT: HQ US Marine Corps, (Code T)

DEVELOPER: Naval Training Systems Center, Orlando, FL  
32813

PURPOSE: LANDING FORCE will be a computer-assisted, manual, wargame-based training system designed to provide training within the context of a highly realistic simulation involving a regiment operating as part of a Marine Amphibious Brigade (MAB). LANDING FORCE provides selected personnel from infantry, tank, artillery, and some other combat support units with an opportunity to practice planning, decisionmaking, coordination, and communication skills in simulated combined arms operations.

GENERAL DESCRIPTION: LANDING FORCE will be a real-time, two-sided simulation of combat involving the ground, air, and combat support/service support assets of a Regimental Landing Team (RLT) and the supporting arms normally available to a Marine Amphibious Brigade (MAB). The opposing forces will represent the combat assets of various types of reinforced Soviet divisions. Models will be stochastic and will use limited shot-on-shot, but mostly aggregate, combat resolution methods. LANDING FORCE will contain a Ground combat Element (GCE), Air Combat Element (ACE), and Combat Support Element (CSE) module each of which can be utilized individually or combined for a complete MAB level exercise.

DATE IMPLEMENTED: Undergoing prototype testing, beginning September 1986

INPUT: Data are required for scenario development only. Some scenarios may require tailoring of war game simulation components of the training system. During exercises, player decisions are required on a continual basis.

OUTPUT: Combat results are provided to players in real-time via a controller group. After the game, action reports and critiques are provided by the controllers based on the results of player decisions.

LIMITATIONS: Military operations in urbanized terrain are not simulated. Nuclear and chemical aspects are very aggregated.

HARDWARE:

Type computer: None  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: To be determined  
Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time: 12 to 28 hours  
controller training time  
CPU Time per Cycle: 10 minutes  
Data Output Analysis:

Security classification: UNCLASSIFIED

Frequency of use: Expected 16 to 24 times per year

Users: Regimental Landing Teams; Marine Air Groups;  
Brigade Service Support Groups (GCE, ACE, CSE) of Marine  
Amphibious Brigade (MAB); USMC Formal Schools at MCDEC,  
LFTCLANT, LFTCPAC

POINTS OF CONTACT: (Developer) Project Director,  
305-646-4888, AV791-4888

KEYWORD LISTING: Air combat element (ACE), ground combat  
element (GCE), combat support element (CSE), marine  
amphibious brigade (MAB), regimental landing team (RLT),  
combined arms, ground-air warfare, ground warfare,  
amphibious warfare.

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: LOG-MAN-X - Logistics Management Exercise

MODEL CATEGORY: Logistics

PROPONENT:

DEVELOPER: Air Force Institute of Technology, School of Systems and Logistics, (AFIT/LS)

PURPOSE: LOG-MAN-X is a management game designed to emphasize sound management practices. Long-term, short-term, and interim planning is emphasized throughout the game. Communications, too, is a management requirement. The interrelationship and interdependence of decisionmaking is a positive learning outcome. The analysis of data and the decisionmaking associated with analysis is also a management requirement. Sound budgeting practices and equally sound financial management are stressed. The relationship between Air Staff/Ops Staff and Logistics Staff is emphasized. The objective is to improve management skills in a classroom environment without the real-life impact of grounded weapon systems and budget overruns. Over 20 different versions of LOG-MAN-X have been developed over the years but only 4 are currently in use.

GENERAL DESCRIPTION: LOG-MAN-X is a manual, logistics management game involving the procurement, repair, and distribution of a repairable, high-cost item to support a fictitious tactical fighter called the F222 at five bases--two of them overseas. There are three competitive contractors with bids for procurement and repair, together with a depot repair organization. The item to be managed is a pressure regulator that fails randomly but the randomness closely follows the Poisson Distribution. The AFLC commander requests a 95 percent confidence level of support. The game is a role-playing game with the students assuming the roles of logistics manager, procurement manager, maintenance manager, distribution and transportation manager, and requirements manager. The exercise director (faculty) keeps the score manually and also role-plays in whatever role the students require. Ideally, the simulation should be played in teams of five students although it is possible (but not desirable) to play with larger teams. Decisions are made on a monthly basis for 24 months. Failure data are provided on a monthly basis together with informative handouts describing any influencing events that have occurred or are planned such as production stoppage, increased flying hours, squadron moves, etc. Apart from the overall management objectives of the simulation, the teams have a specific objective of maintaining support and keeping down the

costs. All decisions are costed and grounded aircraft are also costed. Consequently, total cost is a measure of the effectiveness of the logistics support.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: Each team requires an exercise director to keep the records and direct the game. Small teams (five students) are preferable to obtain maximum participation; however, there is no limit on the number of teams. Each team requires a separate room. Exercise directors must be trained to monitor, score, and direct the game. LOG-MAN-X has been programmed for the computer but the use of the computer did not materially assist in running the game and it did not reduce the requirement for a competent exercise director. The game can be played in any location with any type of team make-up.

HARDWARE:

Type computer/Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation: LOG-MAN-X Student Manual (AFIT/LS),  
Exercise Directors' Notes (AFIT/LS)

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:  
Security classification:  
Frequency of use:  
Users: Air Command and Staff College (ACSC), USAF  
Senior Noncommissioned Officer Academy (AFSNCOA/AFIT/LS),  
Air Force Academy, AFLC Noncommissioned Officer Academy,  
other DoD agencies

POINTS OF CONTACT:

KEYWORD LISTING: Logistics management, manual

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint chiefs of Staff.

TITLE: LOG MOD Logistics Module

MODEL CATEGORY: Unit Training. Manual Wargame

PROPONENT: Combined Arms Training Activity, Fort Leavenworth, Kansas.

DEVELOPER: As above.

PURPOSE: Enhance training of maneuver battalion S4s, Support Platoons and Company personnel.

GENERAL DESCRIPTION: The LOG MOD is designed as a stand alone package which can be played by a maneuver battalion S4, support platoon, and company personnel. It can be used at battalion and brigade levels in conjunction with battle simulations, CPX, FTX, and other such exercise. It can also be used as a game in itself or as an operational aid.

Unlike the battle simulations, LOG MOD does not have rules or tables. Rather, it is designed as a tool or aid which enables a maneuver battalion S4 to keep track of and manage the equipment and supplies of which he is responsible and to perform his combat mission in accordance with his field SOP.

INPUT: Unit TOE/MTOE, unit load plans, unit basis loads vehicles identification, consumption data, unit SOP.

OUTPUT: Tactical logistics problems requiring planning, programming and movement of unit supply equipment and personnel.

MODEL LIMITATIONS: Limited to logistics staff and support personnel within a battalion or brigade.

HARDWARE: Manual Wargame

SOFTWARE: GTA 101-1-1

GENERAL DATA:

Time requirements: Preparation training time: 1-4 hours.

Security classification: Unclassified

Frequency of use: Often

Users: Army battalion and brigade staffs

Miscellaneous: A video tape, 950-777-0809-B, is available for use with LOG MOD.

POINT OF CONTACT: Combined Arms Training Activity  
ATTN: ATZL-TAS  
Fort Leavenworth, Kansas 66027  
(913) 684-3189  
Autovon 552-3189

KEYWORD LISTING:

CATALOG LISTING: United States Army Training Support  
Center Bulletin Number 84-1. Headquarters, United States  
Army Training Support Center, Fort Eustis, Virginia.

TITLE: LOG-PLAN-X - Logistics Planning Exercise

MODEL CATEGORY: Logistics

PROPONENT:

DEVELOPER: Air Force Institute of Technology, School of Systems and Logistics (AFIT/LS)

PURPOSE: LOG-PLAN-X is a management game designed to emphasize sound management practices. Long-term, short-term, and interim planning is emphasized throughout the game. Communications is a management requirement. The interrelationship and interdependence of decisionmaking is a positive learning outcome. The analysis of data and the decisionmaking associated with the analysis is also a management requirement. Sound budgeting practices and equally sound financial management are stressed. The relationship between Air Staff/Ops Staff and Logistics Staff is emphasized. The objective is to improve management skills in a classroom environment without the real-life impact of grounded weapon systems and budget overruns.

GENERAL DESCRIPTION: LOG-PLAN-X is a manual simulation involving logistics planning for the deployment of a fictitious tactical fighter wing in support of a NATO-type agreement in a fictitious overseas country. Student teams, operating as the Wing Logistics Staff, must first determine the maintenance concept to be operated while deployed--a Queen Bee repair concept or relying on the repair facilities existing in the host country. A cost analysis must be developed. Following the development of the maintenance concept, the team must arrive at an operating budget for the deployment, instruct the depot item manager how many pressure regulators to procure, and the delivery schedule desired. These initial decisions are made 3 months prior to deployment. Following these initial plans and decisions, the Wing Logistics Staff are located at the Wing Base in the overseas country with the responsibility of supporting three tactical fighter squadrons located on three remote bases. The only item to be managed is a high-cost, repairable item called a pressure regulator. The regulator must be repaired, shipped, and procured to provide a 95% confidence level of support for a deployment lasting six months. The simulation is a role-playing exercise with students assuming different roles within DCR and DCM at the Wing level. Failure data are supplied every two weeks during the deployment and decisions must be made related to these failures. In addition to these periodic failure data, other handouts are given from time to time to describe events or problems that have arisen--problems and

events of a real-life nature. Decisions (and indecisions) are costed and another objective is to maximize support and minimize costs. Consequently, the effectiveness of the plans and decisions can be measured in total system support costs.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: Each team requires an exercise director to keep the records, role play, and direct the simulations. The simulation is only effective with small teams (four or five students); however, there is no limit to the number of teams. Each team requires a separate room. The simulation is very demanding on the exercise director because of the flexibility during the play. LOG-PLAN-X has not yet been programmed for the computer but it probably will be some time in the near future.

HARDWARE:

Type computer:  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation: LOG-PLAN-X Student Manual (AFIT/LS),  
Exercise Directors' Notes (AFIT/LS)

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:  
Security classification:  
Frequency of use:  
Users: AFIT/LS, Air Force Academy, Canadian Forces  
Command and Staff College

POINTS OF CONTACT:

KEYWORD LISTING: Logistics, manual.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.



TITLE: M-14 (Model 14)

MODEL CATEGORY: Transportation and mobility

PROPONENT: Headquarters, Military Air Command, (HQ,  
MAC/XPSR), Scott AFB, IL

DEVELOPER: HQ MAC-XPSR

PURPOSE: The M-14 is a computerized, analytical model that allows the identification and resolution of strategic aircraft chokepoints at the airbase level during wartime surge situations. Interactive variations can be used for crisis management training.

GENERAL DESCRIPTION: The M-14 is a one-sided, stochastic model designed for individual aircraft movements of four types that service worldwide cargo requirements of four types from multiple scenarios by utilizing a 422 airbase network over which aircraft are routed to use idle resources and to avoid facility and personnel saturation.

INPUT:

- O Station data, e.g., location, resources, climatology, type
- O Aircraft operating envelopes
  - Movement requirements
  - Policies

OUTPUT: All outputs are raw data--mission itineraries, requirement histories, GASP statistics, queuing files--and other simulation information against which retrieval utilities are developed and run for analysis purposes. Off-line analysis depends upon the study intent.

MODEL LIMITATIONS:

- O Heuristic routing
- O Unscheduled maintenance is a function of maintenance actions/flying hours

HARDWARE:

- O Type of Computer: CRAY 1S
- O Minimum Storage Required: 600K 64 bit words
- O Peripheral Equipment: CDC 640 for input/output interface to the CRAY

SOFTWARE:

- O Programming Language: FORTRAN
- O Documentation: HQ MAC/XPSR Background Paper, "The M-14 Simulation Model," dated 1 Oct 81

GENERAL DATA:

Time requirements:

- O To Acquire Data Base: 2 man-weeks
- O To structure Data in Model Input Format: 2 man-weeks
- O To Analyze Output: 1 man-week
- O CPU Time per Cycle: 20 seconds/simulated day

Security classification: UNCLASSIFIED

Frequency of use: Once a month

Users: OSD/PA&E/HQ MAC, USAWC

Miscellaneous: Interactive variant can be used for crisis management training.

KEYWORD LISTING: Computerized, analytical, M-14, aircraft, one sided, stochastic

POINT OF CONTACT: HQ MAC/XPSR  
Scott Air Force Base, IL 62225  
Telephone: AUTOVON 638-5560

KEYWORD LISTING: Computerized, Stochastic, Logistics, Event Store, GASP, Strategic Mobility

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: MACE - A Microcomputer Based Battalion Level Battle Simulation

MODEL CATEGORY: Conflict other than strategic nuclear - corps or lower level/air-ground - conventional, nuclear, chemical/biological

PROPONENT: US Army TRADOC Analysis Center, (TRAC), Ft. Leavenworth, KS

DEVELOPER: same

PURPOSE: MACE is designed to train and exercise commanders and staffs at battalion and brigade level with normal combat support and combat service support elements in a simulated non-nuclear, combined arms combat environment against appropriate enemy forces in command and control and staff coordination.

GENERAL DESCRIPTION: MACE is a computer assisted two-sided, mixed land and sea training, general war model. It is similar to CAMMS, but it has its own Apple II computer. Terrain is shown with video disc, permitting overlapping of symbols.

INPUT: Weapon characteristics, troop lists, TOE (personnel, ammo, POL, equipment), unit orders, environmental factors.

OUTPUT: Color monitor display of tactical situation using computer graphics overlaid on video-disk-generated map background; computer listings of combat results and unit status; raw data used at the executive station monitor and control system performance; postprocessing of collected data for exercise.

MODEL LIMITATIONS: Microprocessors limit the number of events that may be effectively processed during the 4 minute cycle (60 maneuver, 8 conflict, 5 air missions, 5 artillery, 3 resupply). Controller evaluation of line-of-sight, detection, and terrain factors used to determine rate of march and unit equipment. A video disk is required for each new terrain area.

HARDWARE: Computer - 9 Apple II plus 48k byte micro  
Storage - 48k (microprocessor), 20 Mbyte (disk)  
Peripherals - 1 CORVUS 20 Mbyte drive, 4 MCA  
Discovision video disk players, 4 Symtec PGS II graphic systems.

SOFTWARE: Programming language - FORTRAN, PASCAL, ASSEMBLER.

Documentation - available on request.

GENERAL DATA:

Time requirements:

Data base: acquisition - immediate

preparation - 2 man-months

Set-up time: 1 week interactor training. 4 hour  
player training

CPU time: 60 sec.

Security classification: Unclassified

Frequency of use: Active Army components: quarterly,  
reserve components: semiannually.

Users: Battle Simulations Center, Ft Lewis, WA;  
battalion battle staffs.

POINT OF CONTACT: AUTOVON 552-4528/3862  
Commercial (913) 684-4528/3862

CATALOG LISTING: ABCA Catalog of War Games, Training  
Games, and Combat Simulations. Quadripartite Working Group  
on Army Operational Research, 1983. Prepared by Office of  
the Deputy Undersecretary of the Army (Operations Research)

Catalog of Wargaming and Military Simulation  
Models, 1986. Joint Analysis Directorate, OJCS

TITLE: MAIN-MAN-X - Maintenance Management Exercise

MODEL CATEGORY: Logistics

PROPONENT:

DEVELOPER: Air Force Institute of Technology, School of Systems Logistics (AFIT/LS)

PURPOSE: MAIN-MAN-X is used to present the complex nature of a base-level maintenance operation and the various problems and decision variables involved. MAIN-MAN-X can be used as a management simulation to test a team's skill in managing manpower and resources to achieve increased efficiency and effectiveness. Also, the exercise may be used to show cause and effects of maintenance management decisions. MAIN-MAN-X permits unlimited simultaneous team plays.

GENERAL DESCRIPTION: MAIN-MAN-X is an interactive maintenance management simulation involving a team representing the functions of a USAF base maintenance organization. During the play of the exercise, the team will use computer maintenance data products and appropriate monitor-provided inputs to make decisions concerning: managing personnel resources, increasing the productivity of the maintenance organization, increasing the capability to support operational commitments of the assigned weapon system, identifying potential/existing technical problems, determining maintenance capability, managing the configuration management program, and managing the base component repair program. The team will manage the logistics aspects (personnel utilization, supply, maintenance, and base support functions) of a mythical fighter wing. The situation at the beginning of play involves a maintenance organization with an acceptable operational mission capability, undermanned and low-skilled maintenance technicians, mismanaged personnel resources, low reliability in many components/systems, and an unacceptable component repair rate. The goal of the team is to manage the maintenance operation to achieve an optimum of reliable sorties and operational rates.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: The first increment of predefined data (month of March) is historical and cannot be altered. Each succeeding increment (April, May, June, and July) of

predefined data (both labor resources and technical) can be changed by additions, deletions, and revisions to monitor input based upon team decisions.

HARDWARE:

Type computer: Honeywell 6000  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: FORTRAN IV  
Documentation: Users' Manual - Student Guide/Faculty Handouts

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification:

Frequency of use:

Users:

POINTS OF CONTACT:

KEYWORD LISTING: Maintenance management, computerized.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: MINI-STICK - Tactical Fighter Nonnuclear Weapons  
Employment Exercise

MODEL CATEGORY: Conflict other than strategic nuclear/air  
combat - one-one-one

PROPONENT:

DEVELOPER: Space Weapons Directorate, Institute for  
Professional Development (AU/IPD)

PURPOSE: MINI-STICK is used to familiarize students with  
the basic concept of planning nonnuclear weapons  
employment. A significant collateral benefit is the  
stimulation of cadet esprit through flight competition.  
The program produces high morale among the cadets and is a  
practical lesson on theoretical tactical force employment.

GENERAL DESCRIPTION: MINI-STICK represents one day's  
allocation of aircraft against a variety of targets. Both  
targets and aircraft are assigned point values. Target  
points are awarded if the target is successfully attacked.  
Aircraft points are inherited initially, but are lost if an  
aircraft is shot down or is out of commission at the end of  
the day's action. Specific tasks include selecting the  
best weapon for each target, specifying the number of  
aircraft to be allocated against each target, and  
specifying the order in which the targets are to be  
attacked. The objective is to allocate resources  
(airplanes and weapons) to obtain the maximum points.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: A target may be attacked by only one flight  
of aircraft. All aircraft attacking the target must be in  
the same flight and must all carry the same weapon load.  
The minimum number of aircraft in a flight is three; there  
is no maximum. Complete freedom is given to attack or not  
to attack any target, and to choose the order in which  
targets are attacked.

HARDWARE:

Type computer:  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:

Documentation: Operation and user manuals are both within the Tactical Force Application booklet.

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification:

Frequency of use:

Users: Air Force Reserve Officers Training Corps  
(AFROTC)

POINTS OF CONTACT:

KEYWORD LISTING: Aircraft allocation.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.



TITLE: Exercise MOBILE STORE

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: Central Studies Establishment, Canberra, Australia.

DEVELOPER: As Above

PURPOSE: Exercise MOBILE STORE is an administrative war game designed to exercise students in the conduct of road transport tasks at Division level and when used in CPX mode to train Troop Squadron and Regimental HQ.

GENERAL DESCRIPTION: Exercise MOBILE STORE is a one-sided war game designed to aid instruction in road transport operation at transport training centres and when played in CPX mode provides HQ training for road transport units. The game considers the following aspects of road transport, the distribution of combat supplies, the interface between Division and Corps transport responsibilities, and unitisation of cargo loads, the location of transport unit and the size of vehicles to be used. The game is usually played in real time when played in CPX mode. When played at training establishment, 24 hours of exercise time equals six hours of game time.

INPUT:

- O A series of five 24 hour operational situation maps.

OUTPUT:

- O Consequence of players actions

MODEL LIMITATIONS: Adjudication rules have to be simplified to cater for quick manual adjudications.

HARDWARE: Game Handbook

SOFTWARE: Manual war game

STAFF:

- O Control: Three officers and three NCOs
- O Player teams:
  - As a CPX HQ game.
    - Sqn HQ - 5 to 7 pers
    - Reqt HQ - 3 to 5 pers.
  - In small team play mode three to four players per HQs played.

GENERAL DATA:

Time requirements:

- O Preparation: Three hours required for players to prepare their HQ and familiarization of handbook.
- O Play: Two to three days with between 8 to 10 hours of play per day.
- O Analysis: For 30 hours of game play about three hours.

Security classification: UNCLASSIFIED

Frequency of use: Played 3 hours per year.

Users: Transport Squadrons, Army School of Transport.

Miscellaneous: As game play is increased and the experience base is enlarged, more involved adjudication rules covering a broader spectrum of events will be introduced into game play, together with some computer assistance, in particular, in such areas as road movement control. Work has commenced on the development of road transport war games at Corps, COMM Z and Support Area levels.

KEYWORD LISTING: One-sided, road transport

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: MTM - McClintic Theater Model

MODEL CATEGORY:

PROPONENT: US Army War College

DEVELOPER: As Above

PURPOSE: The McClintic Theater Model was designed to fulfill two purposes at the US Army War College. It is used as part of the Army War College curriculum as an educational tool for senior officers, and it is used by general officers and their senior staff as an analytical tool to examine corps strategy, tactics, and sustainability as part of the US Army Tactical Command Readiness Program. The model is used to compare alternate military concepts, strategies, and forces in order to gain insight into potential problem areas and to uncover opportunities for success. It serves as a dynamic discussion vehicle for examining time and space relationships on the battlefield, to include joint operations. Utilization of the model allows the players to become familiar with real-world aspects of the terrain and units in the order of battle.

GENERAL DESCRIPTION: The McClintic Theater Model is a closed, two-sided, four-service, interactive computer model that allows simultaneous input of orders from both sides. It is built on a philosophy which recognizes that those who participate in the war game learn the most from it. Consequently, the model has been written so that the players do not need a knowledge of computer programming. Player inputs (orders) are entered in a natural, English-like manner in which spacing, order, and extraneous words do not matter. The model is time driven at rates varying from zero up to 72 to 1, dependent upon the players' ability to keep up. It is a four-service model that not only looks at each service separately, but also looks at the interactions between services, such as airlifts, sealifts, naval gunfire, suppression of enemy air defenses, close air support, and interdiction. Factors considered include weather, intelligence, local population, two classes of supplies, unit-carrying capacities, and others.

INPUT:

- 0 Pregame
  - Terrain and road network data
  - Orders of battle (25 data items on each unit)
- 0 During game
  - Orders to units (free form, English-like)

#### OUTPUT:

- O During game
  - Estimated times of arrival
  - Logistics warnings
  - Logistical reports
  - Situation reports
  - Intercepted enemy radio traffic
  - Indirect fire damage reports
  - Airstrike damage reports
  - Nuclear/chemical weapons usage
  - Five tapes of intelligence reports
  - Combat/battle reports
  - Other reports
- O Afteraction Analysis
  - Graphical outputs in graph, bar chart, or map form, of any variables in the war game

#### MODEL LIMITATIONS:

- O Maximum number of units is 300 (These limitations can be overcome by changing the DIMENSION statements if additional memory is available)
- O Maximum map area is 6 feet high by 8 feet wide (These limitations can be overcome by changing the DIMENSION statements if additional memory is available)

#### HARDWARE:

- O Computer: Honeywell 6060 (WWMCCS or Altos 800 series microcomputer)
- O Operating System: GCOS or microcomputer OS
- O Minimum Storage Required: 69K Honeywell, 208K Altos
- O Peripheral Equipment: Tektronix Graphics Terminal (Optional)

#### SOFTWARE:

- O Programming Language: FORTRAN (Honeywell); PASCAL (microcomputer)
- O Documentation: McClintic Theater Model
  - Volume I - War Game Director's Model
  - Volume II - User's Manual
  - Volume III - Controller's Manual

#### GENERAL DATA:

Time requirements:

- O One day to acquire existing data base through WWMCCS Information Network (WIN) or to mail computer tapes
- O One day to structure new data in model input format

- O Output analysis time varies with purpose of the exercise, but is assisted by graphical outputs at the end of the war game
- O Run time varies with length of time to be simulated and speed of play (up to 72 times real time)
- O 2-4 hours for player learning time

Security Classification: UNCLASSIFIED

Frequency of use: Monthly at USAWC

Users: - JAD, OJCS, Pentagon  
 - Readiness Command, MacDill AFB, FL  
 - VII Corps, Stuttgart, FRG  
 - Army War College, Carlisle Barracks, PA

POINT OF CONTACT: Commandant  
 US Army War College  
 ATTN: AWCAG (Mr. Fred McClintic)  
 Carlisle Barracks, PA 17013  
 Telephone: AUTOVON - 242-3017  
 Commercial - (717) 245-3017

KEYWORD LISTING: Theater level, Four-service model, Integrated battlefield, Multi Theater Warfare, Global Warfare, Joint Operations, Land Warfare, Sea Warfare, Air Warfare

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1982. Studies, Analysis and Gaming Agency, OJCS. (Now, Joint Analysis Directorate, OJCS)



TITLE: NAVTAG - Naval Tactical Game Training System

MODEL CATEGORY: Naval models/conventional engagements

PROPONENT: Chief of Naval Operations, (OP-39)

DEVELOPER: Naval Training Systems Center, Orlando, FL  
32813

PURPOSE: This computerized, war-game-based training device is designed to reinforce the tactical skills of the Naval Surface Warfare Officer at the shipboard level.

GENERAL DESCRIPTION: NAVTAG is a time-step, two-sided simulation based largely on stochastic, with some deterministic, modeling techniques. NAVTAG consists of hardware, software, and courseware subsystems. The hardware subsystem consists of three video display terminals and a hard copy printer. Each video terminal contains a display screen, keyboard, mass storage unit, and microcomputer. Computer software has been developed which reacts to decision inputs made by game players and applies a realistic model of platform, weapons, or sensor interactions to simulate Naval warfare. In addition, the printer provides a record of events that can be used to support a postgame critique. Besides the computer hardware and software, a users' manual is available to guide players and the game director through the steps involved in accessing the equipment and playing the game. There is, in addition, the computer-aided User Lesson which allows prospective participants to walk-through an entire sequence of game turns in order to familiarize themselves with using the equipment and playing the game. While NAVTAG also does not simulate the shipboard physical environment or provide a basis for team training (although more than one player can play on the same side). The system merely places the participant in a simulated tactical situation, in command of one or more platforms with specified capabilities, with specific problems to solve. He then acts to resolve the situation to his advantage and to his opponent's disadvantage.

DATE IMPLEMENTED: October 1983

INPUT: The game director sets up the initial scenario by accessing a series of menu selections. He specifies the environment, selects and allocates platforms to the opposing players, specifies the initial weapons loading, and positions all forces. Players then assess the general situation from their own perspective. Players decide what the status of their platforms and their associated systems should be at the start of the game. They implement their

decisions by entering the appropriate commands to set the initial course, speed, altitude/depth, sensor status, and combat system configuration.

OUTPUT: Updated status reports (e.g., detection, system overview, damage, etc.), the geographic plot, alert messages, error messages, and prompts appearing on the video display terminal.

LIMITATIONS: The scope of the NAVTAG training system is limited. It is not intended to replace shore-based training, nor does it attempt to simulate the physical shipboard environment or provide a basis for team training. NAVTAG is designed for use by Surface Warfare Officers, and certain tactical options such as submarine versus submarine interactions are not modeled in the computer software. Other options such as nuclear weapons employment and shore bombardment also are not modeled, largely due to hardware memory and processing limitations.

HARDWARE:

Type computer: WICAT Model 150-3 single Axiom Model  
Ex-1650 microcomputer  
Operating system:  
Storage requirements:  
Peripherals: 3 video display terminals, 2 printers

SOFTWARE:

Programming language: FORTRAN IV  
Documentation:

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification: SECRET-NOFORN

Frequency of use: 1,200 times per year

Users: Naval Surface Warfare Officers and Activities

POINTS OF CONTACT: (Developer) 305-646-4888, AV791-4888

KEYWORD LISTING: Surface warfare, decisionmaking, war-game-based trainer, time-step model.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.



TITLE: NEWAIR

MODEL CATEGORY: Conflict other than strategic warfare/theater level - single service, Air Force

PROPONENT: SHAPE Technical Centre, P.O. Box 174, The Hague, Netherlands, APO New York 09159

DEVELOPER: As Above

PURPOSE: NEWAIR is a theater-level air battle simulation model which addresses the outcome of a conflict between air forces employing conventional weapons. The model is designed for the evaluation of relative air force capabilities in central Europe. The model can be used for interactive wargaming, with the players communicating with the program through remote terminals. A complete campaign, conducted interactively, may subsequently be run as a batch job to perform sensitivity excursions.

GENERAL DESCRIPTION: NEWAIR is a deterministic, time-step model. It will compute the attrition to attacking and defending aircraft and the damage inflicted on runways, shelters, aircraft on the ground, and terminal defense weapons. The model will also compute the number of sorties delivering ordnance to close air support and interdiction targets. The computations are performed separately for each target attacked, reflecting the weapons and aircraft actually taking part in each engagement.

INPUT: Aircraft performance data for each aircraft type to be played; Airbase data; Target data (close air support and interdiction targets); CAP pattern data; Attrition data.

OUTPUT:

- o The program displays an attrition summary at the terminals at the end of each time period simulated
- o More detailed output is printed on the line printer. This includes an airbase report, a CAP-pattern report, and a counter air report

MODEL LIMITATIONS:

- o The number of aircraft types and airbases that can be handled are limited by the core storage available
- o 40 aircraft types and 150 airbases can be handled with 120 K words

HARDWARE:

- O Computer: CDC 6400
- O Operating System: SCOPE 3.4, INTERCOM
- O Storage Requirement: 100 K words
- O Peripheral Equipment: Line printer, at least one terminal

SOFTWARE:

- O Programming Language: SIMULA-67
- O Documentation: No documentation available

GENERAL DATA:

Time requirements:

- O The acquisition of a data base can be fairly time consuming. The coding of the input data in the format required by the model should not take more than 1-2 weeks
- O CPU time requirement is data dependent, typically 100-200 seconds per cycle (8 hours)

Security classification: UNCLASSIFIED

Frequency of use: Not in regular use

Users: SHAPE Technical Centre, with military participation

KEYWORD LISTING: Deterministic, theater level, time step, air forces.

POINT OF CONTACT: SHAPE Technical Centre  
P.O. Box 174  
The Hague  
Netherlands  
APO New York 09159

KEYWORD LISTING: Deterministic, Theater Level, Time Step, Air Forces

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: Exercise NEW PIN

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: Central Studies Establishment, Canberra, Australia.

DEVELOPER: As Above

PURPOSE: Exercise NEW PIN represents a movements war game designed to assist instruction in critical areas of transportation. These areas involve the movement of supplies, terminal facilities and modes of transport. The requirement of the game is to supply 5000 tons per day of civil aid to an island, named Ruritania, which is located to the northeast of Australia.

GENERAL DESCRIPTION: This game is an open one-sided game with a game play to real time equaling one hour of game play to 24 hours of real time (actual movement time).

Exercise NEW PIN was developed as a movement war game to produce a form of training that exposes player teams to the type of problems that occur at random in various locations of the supply line.

The players must recognize the type of problems presented in the supply line by the occurrence of these problems, initiate a correction, know when to apply that correction and know the level at which the correction is to be initiated. It is these characteristics that illustrate the essential difference between NEW PIN as a one-sided movements war game and the conventional TEWT.

In playing NEW PIN, player teams will be made aware of the type of problems that are encountered in obtaining the best throughput of supplies depending upon the relationship between the type of containers (20 ft ISO, BMSS or Pallets), the type of material handling equipment (fork-lifts, cranes, etc.) and the mode of transport employed (sea, air, rail, road, and inland waterway).

Player teams will encounter problems which they will have to solve. To do so, they will have to perform the following tasks: decide whether the problem involves their location directly or indirectly: study the problem; identify how it affects the plan; decide whether resources are available immediately to solve the problem; if not, demand those resources; and decide how the solution will affect other plans involving the total supply system. Having decided on a course of action a SITREP must then be sent to all other levels of command in the supply system.

The other player groups on receiving the SITREP must carry out the necessary staff activities by either concurring with the action taken or by providing an alternative course of action. Each action can be accepted or vetoed at higher levels of command.

Exercise NEW PIN, in the form described above, is designed to cover the principles of movements only and does not consider the type of detail that would be required at unit level.

INPUT: Five 24-hour operational situation maps.

OUTPUT: Consequence of player actions.

PLANNED IMPROVEMENTS/MODIFICATIONS: Development of road transport war games at Corps, COMMZ, and support area levels.

HARDWARE: HP 9845

SOFTWARE:

GENERAL DATA:

Time requirements:

- O Preparation: Depending on the level of play a lead time of between two and eight weeks would be required between notifying the participants and actual game play
- O Two and a half days to play. One day being equal to eight hours
- O Analysis: Depending on the resolution of play, between 3-24 hours

Security classification: UNCLASSIFIED

Users: DMOVT-A, RACT

Miscellaneous: Exercise NEW PIN is being further developed to cater for:

- O terminal operations
- O employment of a full military ORBAT
- O deployment and supporting of a TP to the Island
- O employment of financial constraints

POINT OF CONTACT: Central Studies Establishment, Canberra, Australia.

KEYWORD LISTING: Transportation, open, one sided.

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS



TITLE: NTE - Nuclear Targeting Exercise

MODEL CATEGORY: Strategic warfare/weapons allocations

PROPONENT:

DEVELOPER: HQ SAC/DCS Operational Plans and The Air War College

PURPOSE: NTE is used to assist senior level officers in understanding the linkage between US national policy and strategic force structure capabilities and limitations. Prior to the actual play of NTE, each student is afforded the opportunity to listen and question national leaders responsible for policy development and to discuss with those speakers the expectations and problems that are intertwined with policy declarations. Through these encounters the student gains a greater understanding of the significant impact that changes and shifts in US policy have on friends and adversaries. A detailed study is then undertaken on the current force structure of ICBMs/SLBMs/bombers. Each system is looked at with the intention of gaining a thorough insight into strengths and weaknesses. A final preparatory step to NTE is an overview of how the planning process is structure from policy to application. Armed with this background, the student uses the NTE for some "hands on" application of the process. The key issue for senior level officers involves the decisionmaking apparatus that must blend policy and force structure together while maintaining the ultimate objective of deterring conflict. Understanding the process is crucial to senior officers who, in future leadership roles, will most likely be required to provide inputs from their prospective planners, operators, logisiticans, developers or intelligence specialists.

GENERAL DESCRIPTION: The NTE involves the development of specific targeting guidance for strategic nuclear forces, based on United States policy as stated by the National Command Authority (NCA). The targeting guidance is used as the source document for the application of strategic nuclear forces against a hypothetical target system. At the present time the exercise does not use AU computer support. NTE is unclassified and duplicates, in a simplified manner, the linkage that exists between US national policy for the use of strategic nuclear forces and the detailed employment planning of the current ICBM/SLBM/bomber weapon systems. A theoretical National Security Council (NSC) policy document is provided to begin the exercise. The document is based on recent unclassified policy statements expressed by the NCA. Based on these statements, NTE participants must create a guidance package

that can be used exclusively by the agencies designated to target US strategic nuclear forces. A small sampling of the TRIAD forces are provided for the targeting phase of NTE. The objective is to meet the explicit guidance direction using the given forces and a hypothetical target base. The primary objective of the NTE from policy interpretation, through guidance development, to targeting application is to impart to each participant a general knowledge of the processes involved in the employment planning for strategic nuclear forces.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS:

HARDWARE:

Type computer:  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation: Nuclear Targeting Exercise - AWC  
Student/Faculty Booklet Navigational Charts and Target  
Overlay (developed by HQ SAC)

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification: UNCLASSIFIED

Frequency of use:

Users: Air War College

POINTS OF CONTACT:

KEYWORD LISTING: Nuclear, ICBMs, SLBMs, bombers.

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.



TITLE: NWCAM - Naval War College Air Model

MODEL CATEGORY: Conflict other than strategic nuclear/multi-theater

PROPONENT: Naval War College, Newport, RI 02841-5010

DEVELOPER: Same

PURPOSE: NWCAM is a campaign level model designed to conduct air-air and air-land wargaming within the large battle context of the Global War Game.

GENERAL DESCRIPTION: NWCAM is an interactive, two-sided, stochastic microcomputer simulation of tactical air warfare. This menu-driven model evaluates both original and prepackaged air strikes against a variety of targets in multiple environments. Some algorithms are expansions and modifications of ADCAP II (developed by Victor Research for Air Force Readiness Command). It also features tracking of aircraft assets and relevant factors at each airbase. The simulation rate is at least one combat day in four hours of game play; missions of opposing forces can be run in parallel.

DATE IMPLEMENTED:

INPUT: Raid parameters including escorts, attack aircraft and ordnance, and target assignments; defensive factors.

OUTPUT: Sequential history files of data, interactions, and results for each mission are put into disk and printed. Statistical tables of aircraft attrition and ordnance for selected intervals are broken out by types, mission phase of occurrences, etc.

LIMITATIONS: Scale of aggregation and game speed ratios preclude finely detailed individual algorithms. Continuous enhancements of model prevents its validation as a static entity.

HARDWARE:

Type computer: Microcomputer  
Operating system:  
Storage requirements: 256k, 128k for parallel modes  
Peripherals: Plotter

SOFTWARE:

Programming language: CBASIC  
Documentation: Manual and source codes

GENERAL DATA:

Time requirements: Data Base:preparation: 3 man-weeks  
(initial), then 1 to 2 minutes (per mission)  
CPU Time per Cycle: 1 min/mission  
Data Output Analysis: 40 min per  
simulated day

Security classification: UNCLASSIFIED

Frequency of use: 2 times per year (5 weeks each time)

Users: US Naval War College, US Air Force Project  
Checkmate

POINTS OF CONTACT: CDR Meldrum/LCDR Healy, 401-641-4285,  
AV 948-4285

KEYWORD LISTING: Wargaming, gaming, computer,  
microcomputer simulation, damage assesement, air, air  
model, theater, campaign, global

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: NWGS - Naval Warfare Gaming System

MODEL CATEGORY: Naval warfare decisionmaking training

PROPONENT: US Naval War College

DEVELOPER: CSC, Defense Systems Division, 6565 Arlington Blvd,  
Falls Church, VA 22046

PURPOSE: NWGS provides a wide range of decisionmaking experiences for active naval commanders and students. The system simulates real world confrontation with more variety and less cost than actual maneuvers.

GENERAL DESCRIPTION: NWGS supports a wide range of tactics and doctrine within the following warfare areas: ASW, AAW, MIW, ARW, SUW, SBU and AMU. NWGS simulates the platforms, weapons and sensors used in real world missions and provides software simulation models for controlling forces. Providing intelligence and assessing battle damage, automated record keeping, computation of game events, and report generation. System has capability of being played and supported from remote locations.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS:

HARDWARE:

Type computer: Honeywell. NWGS includes 44 consoles of standard off-the-shelf components.

Operating system:

Storage requirements:

Peripherals:

SOFTWARE:

Programming language:

Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:

Frequency of Use:

Users: US Naval War College

POINTS OF CONTACT: US Naval War College, CSC Corporation.

KEYWORD LISTING:

CATALOG LISTING: None

TITLE: OPSURV - Operational Survivability Model

MODEL CATEGORY: Conflict other than strategic nuclear/air-ground forces - conventional, nuclear, and/or chemical

PROPONENT: Defense Nuclear Agency, Theater Force Division (NATF), Kirtland Air Force Base, NM 87115-5000

DEVELOPER: The BDM Corporation

PURPOSE: OPSURV is used to assess risk, and measures to reduce risk, for units under threat of nuclear, chemical, and conventional attack. Its applications include planning, training and analysis of doctrines and issues related to survivability.

GENERAL DESCRIPTION: OPSURV is a microcomputer-based model which permits the user to portray the development of friendly forces and threat target acquisition assets in a division's area of influence on a terrain representation (videodisc map or computer graphic), consistent with a given scenario. Those deployments, coupled with other aspects of friendly and threat posture and activity, are input to the computer which models appropriate interactions and determines the probability of detection and of receiving specified levels of damage for units of interest. The user can then select risk reduction actions from a specified, but significantly varied, group of options. The computer, in light of the selected option(s), updates the assessment of risk to survivability and provides the results.

DATE IMPLEMENTED: November 1984

INPUT: Data on division, threat factors, and other parameters.

OUTPUT: Unit deployment terrain are shown on a color monitor with symbols of units at high risk highlighted. The black and white monitor depicts unit data, lists of units at high risk and other output. Printouts of selected output can also be obtained.

LIMITATIONS: The geographical area for gaming is restricted to stored digitized terrain data (currently 200km x 200km in the vicinity of Fulda, FRG.)

HARDWARE:

Type computer: Apple II Plus  
Operating system:

Storage requirements: 10 Mbytes  
Peripherals: CORVUS hard disk, BW monitor, color monitor, printer, joystick, videodisc player, PGS graphics system (SYMTEC), VMI package.

SOFTWARE:

Programming language: PASCAL  
Documentation:

GENERAL DATA:

Time requirements: Data Base: prep. - 2 man-weeks  
CPU Time per Cycle: 4 hours  
Data Output Analysis:

Security classification:

Frequency of use: Undetermined

Users: DNA, US Army Combined Arms Center (CAC)

POINTS OF CONTACT: Proponent: LTC A. Donnel, 505-844-3520

KEYWORD LISTING: Nuclear survivability, chemical warfare, air-land battle model, microcomputer applications, target acquisition.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: PEGASUS

MODEL CATEGORY: Conflict other than strategic nuclear/ground forces only - conventional conflict.

PROPONENT: Battle Simulations Directorate, Combined Arms Training Activity (CATA), Ft Leavenworth, Kansas.

DEVELOPER: As Above

PURPOSE: To exercise battalion and brigade command groups in the performance of ARTEP tasks associated with the control and coordination of combined arms in a simulated combat environment.

GENERAL DESCRIPTION: Command post exercise control system which employs a free-play manual simulation system with opposing forces designed to exercise brigade and/or battalion commanders and staffs in the control and coordination of combined arms operations. Can be either offensive or defensive scenario.

INPUT:

- O Organizations
- O Tactics
- O Kill probabilities
- O Mobility
- O Terrain and weather

OUTPUT: FEBA movement

HARDWARE: GTA 71-2-1

SOFTWARE: Enlarged map sheets superimposed over hexagonal grid.

GENERAL DATA:

Time requirements:

Training: 8-12 hours for controllers and players.

Playing Time: Varies with type unit and scenario.

Staff:

	<u>BN</u>	<u>BDE</u>
Player/Controller*	13-23	35-63
Controllers	4	6

\*The number of Controllers and Player/controllers will vary with the level of play (BN or BDE), number of battalions and the functional areas simulated. (Admin/log, E-war, CM/NUC, AO, etc.)

Security classification: N/A

Frequency of use: Frequent

Users: Active Army components and Reserve components

KEYWORD LISTING: Combined arms operations

POINT OF CONTACT: Combined Arms Training Activity  
ATZL-TAS (MAJ Allman)  
Ft Leavenworth, KS 66027  
AUTOVON 552-3180

CATALOG LISTING: ABCA Catalog of War Games, Training Games, and Combat Simulations. Quadripartite Working Groups on Army Operational Research, 1983. Prepared by Office of the Deputy Undersecretary of the Army (Operations Research)

Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS



TITLE: REL-MAN-X - Reliability Management Exercise

MODEL CATEGORY: Logistics

PROPONENT:

DEVELOPER: Air Force Institute of Technology, School of Systems and Logistics (AFIT/LS)

PURPOSE: REL-MAN-X is used to relate the course material to the acquisition process and give the students an appreciation of the effect that reliability and maintainability decisions have on life-cycle costs.

GENERAL DESCRIPTION: REL-MAN-X is a computer-assisted exercise designed to teach students how to make reliability and maintainability decisions during the acquisition process. The students are divided into teams of 5 or 6 and assume the role of contractors in competition to develop and produce an emergency radio. The teams are provided with a statement of work equipment specifications, a request for a proposal, failure rate data and average repair times. With the assistance of the computer, they develop a proposal that includes the Reliability Program Plan, and an estimate of the life cycle costs of 6 year.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: None

HARDWARE:

Type computer: GE 625  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: Basic  
Documentation: Reliability Management Exercise - AFIT  
Handout, MANARU Proposal - AFIT Handout.

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification:

Frequency of use:

Users: Air Force Institute of Technology, School of  
Systems and Logistics (AFIT/LS)

POINTS OF CONTACT:

KEYWORD LISTING: Reliability and maintainability, life  
cycle costs, computer assisted

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: SAS - Strategic Analysis Simulation - Automated

MODEL CATEGORY: Conflict other than strategic  
nuclear/multi-theater

PROPONENT: National Defense University, Washington, DC and  
Office of Net Assessment, The Pentagon, Rm 3A930,  
Washington, DC.

DEVELOPER: Booz, Allen & Hamilton, Inc., 4330 East-West  
Highway, Bethesda, MD 20814

PURPOSE: The SAS is an interactive, global war game used for both high-level analysis and training. There are two versions of the model, an automated version which is used primarily for training purposes and a computer-assisted version which is used as a policy analysis tool. The model is played in 1-week time increments as includes strategic mobility (sealift and airlift) and logistics, as well as ground, air, and naval engagements in conventional, chemical or nuclear environments. Tactical, strategic and space systems are played.

GENERAL DESCRIPTION: The SAS is uniquely designed to enable players to exercise and analyze national military strategy; global or theater war fighting; strategic mobility options; allocation and reallocation of ground, air, and naval forces; and crisis containment and escalation control. This simulation can be performed efficiently without any technical training when supported by a qualified control group. SAS is highly flexible with relatively simple data base requirements. It provides players with an opportunity to move rapidly through a scenario, focusing on analysis of those events and phenomena which would dominate the outcome of the scenario.

DATE IMPLEMENTED: January 1983

INPUT: Order of battle for each nation, weapon systems (Armored Division Equivalents [ADE], types of aircraft squadrons, ships and other assets), status and location, ground force unit strengths (expressed in ADEs), ADEs conversion factors including divisional firepower and armored vehicle components.

OUTPUT: Separate battles are independently adjudicated and reported. The remaining effectiveness of the individual "weapon system" is reported. Summary turn results are given at the end of each turn. The reports are OPORDER reports, combat reports, logistics depot reports, military sealift reports, and force summary reports. Miscellaneous status information is also available to players upon request.

LIMITATIONS: Combat and logistics are highly aggregated. FEBA movement within a hex and command, control, and communications are not simulated. There is no computer-geographic display. Force positions are updated manually by using magnetic pieces on a world map mounted on a metal backing.

HARDWARE:

Type computer: IBM 3033 (CMS) (automated), 2 IBM PCs (computer-assisted)  
Operating system:  
Storage requirements: 1.2 to 1.5 Mbytes (automated), 640k bytes (computer-assisted)  
Peripherals: 1 or 2 floppy disk drives (computer-assisted)

SOFTWARE:

Programming language: FORTRAN IV (A), Advanced BASIC, LOTUS 1-2-3, and Dbase II (C-A)  
Documentation:

GENERAL DATA:

Time requirements: Data Base: prep - 2 man-months; playing time - 2-hour sessions.  
CPU Time per Cycle:  
Data Output Analysis:

Security classification: UNCLASSIFIED

Frequency of use: 1 to 4 times per year

Users: NDU/WGSC (automated), OSD/NA (computer-assisted)

POINTS OF CONTACT: Proponent - LCOL T. Ryan (NDU),  
293-693-5223  
- Capt. C. Pease (ONA),  
202-697-1312  
Developer - Dr. K. Masterson, Jr.,  
301-951-2580

KEYWORD LISTING: Strategic-level model, global model, global wargaming.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: SEABAT - Sea Battle

TYPE MODEL: MONTE CARLO

SYSTEM: CDC/6600

LANGUAGE: FORTRAN

RESPONSE TIME:

ORIGIN CODE: 201

MEMORY REQD: (K)

DESCRIPTION: Sea Battle is a large scale Monte-Carlo simulation of an engagement between a naval task force and enemy units. It is a three-dimensional simulation in that suprasurface, surface, and subsurface platforms can be exercised on the Blue and Orange sides. The model may portray a brief engagement, a convoy passing through several barriers, or extended carrier operations in hostile waters. The set-up and run times are little affected by the scenario selected for evaluation. A feature of SEABAT is its ability to measure readiness factors as they impact the outcome of the battle. Reliability, and in particular, maintainability are known to drive the outcome of some engagements.

CATALOG LISTING: NAVAIRDEVCON Computer Models. Naval Air Development Center, Warminster, PA.



TITLE: Exercise SEA LION

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional

PROPONENT: Central Studies Establishment, Australia.

DEVELOPER: As Above

PURPOSE: Exercise SEA LION consists of a series of one-sided administrative war games designed to provide instruction in road, sea and rail terminal operations at all levels.

GENERAL DESCRIPTION: Exercise SEA LION consists of a series of games designed to exercise HQs and provide instructions in terminal operations in such areas as unitisation of cargo, ship discharge, HQ staff work, cargo movement control, and air, road, rail and sea transportation. Game I considers a Terminal Regiment involved in road, beach, rail and inland water operations. Game III considers a Terminal Corp HQ employing up to four Terminal Regiments conducting road transport, rail beach and cargo movement control operations through several terminals. (Game V considers a terminal squadron employing up to four troops in beach operations.)

INPUT: An administrative plan requiring 6000 tons per day. Ship loading manifest and planning state are in the handbook.

OUTPUT: Consequences of players action.

LIMITATIONS: Adjudication rules have to be simplified to cater for quick manual adjudication.

HARDWARE: Game Handbook.

SOFTWARE: Manual war game.

STAFF:

- 0 Control - 3 officers and 3 NCOs.
- 0 Player teams - 3 to 4 persons per headquarters played.

GENERAL DATA:

Time requirements:

- 0 Preparation: Three hours required for preparation for the HQ and familiarization of handbook.
- 0 Play: Three days with between eight to 10 hours to play per day.
- 0 Analysis: For 30 hours of game play about three hours.

Security classification: UNCLASSIFIED

Frequency of use: During period 1982-83: Combination of Games I to V - eight days.

Users: 10 Terminal Regiment and Army School of Transport

Miscellaneous: As game play is increased and the experience base is enlarged, the game will be expanded to cater for a broader spectrum of events. Work has commenced on the development of an Air Support Regiment and Third Line Road Transport Wargame. When completed, these games will be further developed into CPX mode play.

POINT OF CONTACT: Central Studies Establishment, Australia

KEYWORD LISTING: One sided, administrative

CATALOG LISTING: ABCA Catalog of War Games, Training Games, and Combat Simulations. Quadripartite Working Group on Army Operational Research, 1983. Prepared by Office of the Deputy Undersecretary of the Army (Operation Research)

Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS



TITLE: SIMNET

MODEL CATEGORY: Combat simulation training, interactive

PROPOSER: Defense Advanced Research Projects Agency (DARPA) and the US Army.

DEVELOPER: Bolt, Beranek and Newman, Inc. (BBN)

PURPOSE: SIMNET is an advanced research project aimed at developing the DoD technology base for large scale networks of interactive combat simulators (Simulator Network). If successful, this technology will dramatically increase the opportunity for units to practice collective, combined arms, and joint war fighting skills in fully crewed, fully interactive, high quality simulators which cost 1/100th of today's simulators and which can be operated at a fraction of the O&S costs of a combat vehicle used for training.

GENERAL DESCRIPTION: While simulators have been shown to be effective for training selected military skills, it is often impossible to but enough to fully train the force because of high cost. Further, because of the absence of a technology to network simulators, they have not been a factor in collective, combined arms or joint training.

SIMNET addresses both of these problems. Its high risk research is aimed at four high payoff areas which are achievable because of recent breakthroughs in several core techniques. These technologies are combined in SIMNET to allow force-on-force, man-in-the-loop, free play combat exercises in simulation which require the same troop leading and command and control skills as in field exercises but which can be run on any terrain location in the world modeled in the simulation. The focus is to give all members of the combat team a massive dose of practice, from platoon/unit to the battalion/task force levels, and possibly higher.

SIMNET components have been designed to be self contained and modular. The lowest common denominator is the single simulator which can be operated completely by itself or be networked with up to 82 more simulators.

DATE IMPLEMENTED: First LAN was operational. September 1986.

PLANNED IMPROVEMENTS/MODIFICATIONS: SIMNET technology may have application for aircraft and naval combat vessels as well as land vehicles. The DARPA long range plan is to develop such, if the network can be created.

INPUT:

OUTPUT:

LIMITATIONS:

HARDWARE:

Type computer: Apple Macintosh  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:

Frequency of Use:

Users: Fort Knox; Fort Benning in 1987 with two other sites selected later. Reserve units will be test sites also. When several sites have LANs in place, the LHN testing will begin which will tie several LANs together.

POINTS OF CONTACT: DARPA, LtCol Jack Thorpe, 202-694-3624

KEYWORD LISTING:

CATALOG LISTING: None

TITLE: SIMULOAD - Job Shop Production Scheduling

MODEL CATEGORY: Logistics

PROPONENT: Air Force Institute of Technology, School of Systems and Logistics (AFIT/LS)

DEVELOPER: The General Electric Company

PURPOSE: SIMULOAD is used to make students aware of fundamental management techniques including organization, planning, communications, decisionmaking, etc.

GENERAL DESCRIPTION: SIMULOAD is a job shop production scheduling simulation. It simulates a company which manufactures special magnetos for small gasoline engines used in power lawnmowers, outboard motors, motor scooters, light airplanes, etc. Because this is a job shop, the emphasis in production scheduling has been on good loading and maximum use of facilities.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: The number of teams involved is limited to the size of the classroom. A minimum of one monitor is necessary to provide the briefing for exercise, act as the sales person, evaluate individual effort, and critique the exercise.

HARDWARE:

Type computer:  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation: Available from General Electric

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification:

Frequency of use:

Users:

POINTS OF CONTACT: AFIT/LS and General Electric

KEYWORD LISTING: Job shop production, scheduling, management.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: STEELTHRUST - USMC War Game-based Training System

MODEL CATEGORY: Conflict other than strategic  
nuclear/air-ground forces - conventional conflict

PROponent: Headquarters, USMC

DEVELOPER: Naval Training Systems Center, Orlando, Florida  
32813

PURPOSE: STEELTHRUST is a manual, battalion level war-game-based training system designed to enable the Marine infantry battalion commander and his staff to make critical battlefield and to experience the results of these decisions during a realistic, real-time combat situation.

GENERAL DESCRIPTION: STEELTHRUST is a real-time, two-sided simulation of combat involving the ground, air, and CSS assets normally available to a battalion landing team (BLT) operating as part of a regiment. The opposing forces have the combat assets representative of various types of reinforced Soviet divisions. The war game is played in the closed mode. The controllers and player/controllers have direct access to the playing surface. The players do not have access to the playing surface. The models are stochastic and are aggregated on a very low level.

DATE IMPLEMENTED: January 1984

INPUT: Data are required for scenario development only. Some scenarios may require tailoring war game simulation components of the training system. During exercises, player decisions are required on a continual basis.

OUTPUT: Combat results are provided to players in real-time via a controller group. After action reports and critiques are provided based on the results of player decisions.

LIMITATIONS:

HARDWARE:

Type computer: None  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: None  
Documentation:

GENERAL DATA:

Time requirements: Set up time: 8 to 32 hrs -  
(controller training time)

CPU Time per Cycle:

Data Output Analysis:

Security classification:

Frequency of use: 40 times per year

Users: Fleet Marine forces; reserve units; and USMC  
formal schools at MCDEC, LFTCLANT, LFTCPAC, and AWS.

POINTS OF CONTACT: NTSC, 305-546-4888, AV 791-4888

KEYWORD LISTING: Ground warfare, combined arms, battalion  
staff trainer, air combat element (ACE), ground element  
(GCE), game-based training system.

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: SQUARE DEAL - Battalion in Aid of the Civil Power

MODEL CATEGORY:

PROPONENT: Wargames Section, Directorate of Land Operational Research (DLOR), Operational Research and Analysis Establishment (ORAE), Ottawa, Canada

DEVELOPER: As Above

PURPOSE: The game is designed to exercise the battalion command post in the conduct of stability operations in Aid of the Civil Power.

GENERAL DESCRIPTION: This is a closed, two-sided, manually conducted game with a 15-minute game time interval. Although desirable to play in real time, this may seldom be achieved because of the time required to complete the control assessments. However, an overall real time/game time ratio of 1:1 can normally be expected. Blue Sideroom organization approximates the operations center of the police and military forces deployed and has with the control room an intelligence link, two operations links and a telephone link simulating the public telephone system terminating in a police switchboard. The setting is an imaginary city in Canada on detailed large scale maps including construction details of all buildings and with a level of resolution down to section size, individual vehicles and snipers.

Assessment procedures cover the following areas: kidnapping, sabotage/demolitions, riots, fire bombing, sniping actions, bomb search, cordon and search, non-crime service calls, crime service calls, crisis-generated calls, vandalism, looting and robbery.

The game is designed for company and battalion level but can be expanded to brigade. The police and civil forces include provincial police, city police, railway police, fire department, campus police, coast guard, and RCMP marine station. Red Sideroom includes the regional leader and cell leaders. This wargame can be conducted by staff colleges and combat arms units.

INPUT:

- 0 Game directive including game objectives, level and scope of the game, player appointments, game assumptions, order of battle and brief outline of the tactical situation
- 0 Game scenario
- 0 Wargame package prepared by DLOR containing all proformae, rules and assessment procedures

OUTPUT: Detailed control room and Blue/Red sideroom logs are maintained for post-game critique.

MODEL LIMITATIONS:

- O Because of the cyclical nature of assessments it is not possible to state the specific time at which certain events took place but only that they did take place within the 15-minute time interval.
- O It is not possible to determine the precise step by step involvement of action and counter action for each individual or sub-unit involved.

HARDWARE: Large scale detailed city map

SOFTWARE: Nil. Manual Assessments. Detailed logs in control room and siderooms.

STAFF: Control Room staff of twelve. Sideroom staff a minimum of eight in Blue Sideroom and four in Red Sideroom.

GENERAL DATA:

Time requirements:

- O Preparation: Given the scenario, operational plans and assessment packages, a one-day period for training control room staff and setup is required.
- O Play: The wargame portion of the exercise usually is conducted in three or four hours. Thus several separate exercises, with same forces and staffing, can be conducted over a few days.
- O Analysis: All detailed logs are retained and analyzed.

Security classification: RESTRICTED

Frequency of use: Unknown. Staff colleges and all combat arms units have individual SQUARE DEAL wargame packages.

Users: As Above

POINT OF CONTACT: DLOR, ORAE, Ottawa, Canada

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS.



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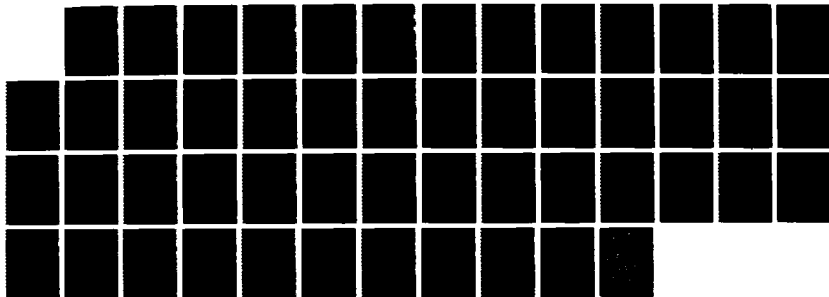
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AND LEADER TRAINING SECOND EDITION(U) TRAINING AND  
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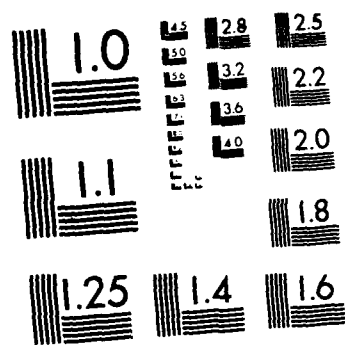
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TITLE: SUP-MAN-X - Logistics Support Management Exercise

MODEL CATEGORY: Logistics management

PROPONENT:

DEVELOPER: Air Force Institute of Technology, School of Systems and Logistics (AFIT/LS)

PURPOSE: SUP-MAN-X is a management simulation designed to emphasize sound management practices. Long-term, short-term and interim-term planning is emphasized. Communications and the interrelationship of decisionmaking are also emphasized. Sound budgeting practice and financial management are accented. Particular emphasis is placed on the relationship of the staff of foreign governments with the logistics support base in the United States. The objective is to improve management skills of the foreign students in a classroom environment without the real-life impact of grounded weapon systems and budget overruns.

GENERAL DESCRIPTION: SUP-MAN-X is a logistics management game in which a foreign country places a contract with the US Government for a high-cost, repairable item and the repair and distribution of that item to support the country's operational squadrons. The logistics staff of the foreign air force must compute requirements, determine delivery schedules, and request support from the US Government. The logistics staff must decide on stock levels and the use of repair facilities (depots and contractors), as well as distribute assets to support their aircraft. SUP-MAN-X is a role playing game with the students assuming the various logistic function roles of a logistics staff and the faculty assuming any role outside of that organization. SUP-MAN-X is not a computerized exercise, consequently the exercise director also maintains a logistics status record for the students. The game is designed for teams of 5 students and play continues for 18 months of support with logistics decisions being made every month. Failure data are supplied by the exercise director on a monthly basis together with the information handouts describing events that have occurred or are planned maintenance problems, changes in flying hours or deployments, etc. Apart from the overall objective of increasing managerial effectiveness, the teams must maintain support and keep the costs down. The total cost of system support is a measure of the effectiveness of that support.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS:

HARDWARE:

Type computer:  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation: SUP-MAN-X Student Manual (AFIT/LS), and  
Exercise Director's Notes (AFIT/LS)

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification:

Frequency of use:

Users: This simulation has been used in Iran, Turkey,  
Vietnam, and with foreign students assigned in the United  
States.

POINTS OF CONTACT:

KEYWORD LISTING: Logistics management

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: SUWAMM III - Strategic Unconventional Warfare  
Assessment Model

MODEL CATEGORY: Conflict other than strategic nuclear/  
unconventional warfare

PROPOSER: National Defense University, War Gaming and  
Simulation Center (WGSC), Fort McNair, Washington, DC  
20319-6000

DEVELOPER: Same

PURPOSE: SUWAM III is an educational tool used in WGSC  
exercises and games. It encourages the use of Special  
Operations Forces in large, two-sided war games. The model  
is not an analytical tool. The data bases are notional and  
incorporate the element of chance into mission assessments.

GENERAL DESCRIPTION: SUWAM III is completely automated.  
It requests mission data from the user, evaluates the data  
for its probable impact on the success or failure of each  
"event" in the mission, sequentially simulates and assesses  
each event and outputs the results in the form of a printed  
mission report. Each mission must include a mission force  
of at least one team, a target, a choice of action type,  
and a series of events. Some of the action options  
available in SUWAM III include direct action--against  
material or personnel targets, information gathering,  
hostage recovery, laser emplacement, and take and hold  
operations.

DATE IMPLEMENTED:

INPUT: The model asks the user for the kind of input or  
displays information for the user's reference. For each  
question asked, guidance is given on how to answer.  
Questions include the country code, target class, team size  
(e.g., SEALS, Rangers), and time allotted.

OUTPUT: Computer printouts including game information (if  
requested), assessment (if any), team casualties,  
operational status, time used, and overall mission success/  
failure assessment.

LIMITATIONS: Must have a minicomputer, preferably the  
KAYPRO II, to perform the exercise.

HARDWARE:

Type computer: KAYPRO II  
Operating system:  
Storage requirements:  
Peripherals: Okidata dot matrix printer.

**SOFTWARE:**

Programming language: PASCAL  
Documentation:

**GENERAL DATA:**

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis: 10 minutes

Security classification: UNCLASSIFIED

Frequency of use:

Users: National Defense University, Naval War College.

**POINTS OF CONTACT:** (NDU) COL Alnwick, USAF,  
202-475-1251/2, AV 335-1251/2

**KEYWORD LISTING:** Simulation, Special forces,  
unconventional warfare, SEALS, Rangers, SPETSNAZ

**CATALOG LISTING:** Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: SYS-MAN-X - Systems Management Exercise

MODEL CATEGORY: Miscellaneous

PROPONENT:

DEVELOPER: Air Force Institute of Technology, School of Systems and Logistics (AFIT/LS)

PURPOSE: SYS-MAN-X is a management simulation designed to emphasize sound management practices. Long-term, short-term and interim-term planning are emphasized. Cost analysis of concepts and engineering change proposals must be computed. Communications and the interrelationship of decisionmaking are also emphasized. Sound budgeting practice and financial management are accented. The problems associated with 3 years of weapons system support are presented for resolution and solution.

GENERAL DESCRIPTION:

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: Each team requires an exercise director to direct the game and role-play, and a separate seminar (game) room. The seminar room must be located adjacent to batch operated computer facilities. SYS-MAN-X is currently programmed as a batch operation on the CREATE computer system with a maximum of 9 teams playing at the same time. This game should be played in 3 straight classroom days. Student teams should consist of at least 5 students, but no more than 7 to ensure maximum participation and management training.

HARDWARE:

Type computer: Honeywell 635 (6000)  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: FORTRAN IV  
Documentation: SYS-MAN-X Student Manual (AFIT/LS),  
Exercise Director's Notes (AFIT/LS), and Extensive  
Programmer documentation.

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification:

Frequency of use:

Users:

POINTS OF CONTACT:

KEYWORD LISTING:

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.



**TITLE:** SYS-MAN-X PERT Phase - Systems Maintenance  
Management Exercise PERT Phase

**MODEL CATEGORY:** Miscellaneous

**PROPONENT:**

**DEVELOPER:** Air Force Institute of Technology, School of  
Systems and Logistics (AFIT/LS)

**PURPOSE:** PERT PHASE is designed to increase understanding of the planning requirements for a new maintenance workload and to appreciate the use of PERT, a technique of operations research, as a management planning and control tool. The PRERT PHASE helps students analyze the requirements in organizing maintenance and repair facilities in the DoD logistics system. It also helps students comprehend the nature of pipeline times and how one activity may affect the beginning of another even though it is not directly related. PERT can be used further to demonstrate the computer application on larger expanded programs whose only display is a report or a printout from a data processor.

**GENERAL DESCRIPTION:** The PERT PHASE of SYS-MAN-X is an interactive maintenance management planning and control simulation. It is used to construct a PERT time network to illustrate the planning and preparation necessary to start overhauling a new item in a depot Technological Repair Center at a given date. This requires the correlation and integration of many selected key teams are those selected for the basic SYS-MAN-X; the PERT PHASE is an annex to the overall simulation. Each team displays on a magnetic board the various interconnected activities and their mutual relationships, phased-time-wise, in accordance with the actual real-time estimates. The goal of the team is to identify the obstacles which will preclude meeting the due date and to provide management decisions to solve each problem area that this due date may be met.

**DATE IMPLEMENTED:**

**INPUT:**

**OUTPUT:**

**LIMITATIONS:** The baseline data (SYS-MAN-X and PERT PHASE) are predefined and are the same for all teams.

**HARDWARE:**

Type computer: Honeywell 635  
Operating system:

Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: FORTRAN IV  
Documentation: System Maintenance Management Manual;  
PERT PHASE Revision 5, 30 June 1978.

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification:

Frequency of use:

Users:

POINTS OF CONTACT:

KEYWORD LISTING:

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: TACOPS - Tactical Operations

MODEL CATEGORY: Conflict other than strategic nuclear/theater level multiservice

PROPONENT: Army War College, Carlisle Barracks,  
PA 17013-5050

DEVELOPER: Same

PURPOSE: TACOPS is intended for use in a small classroom environment (less than 20 students). It is designed to instruct the students, through practical exercise, about command decisionmaking issues at the operational level of combat.

GENERAL DESCRIPTION: The TACOPS model is a highly aggregated, two-sided, closed, interactive war game designed to model land combat at the theater and corps level. Its structure is essentially deterministic and it is a time stepped model. The level of aggregation depends on user requirements; resolution ranges from brigade/regiment for the corps level version to corps/army for the most highly aggregated theater level versions. The ratio of game time can be set by the controller from 1 to 72 times real time. Resolution of combat encounters is basically accomplished by a table look up, based on the environment, with a statistical variation.

DATE IMPLEMENTED:

INPUT: Three data bases are required including a parameter data base which contains force allocation parameters, a terrain data base, and a data base describing unit performance parameters. Weapon systems are represented as a single force effectiveness value. Directions to units, force allocation, and other command decisions are entered through a specially designed user interface system. Two interactive input systems exist--one for the players and one for the controller.

OUTPUT: Reports on the friendly situation, intelligence, logistics, and combat support asset allocation are issued by the model at user specific times. In addition, spot reports of battle activity and intelligence intercepts are printed on an as occur basis.

LIMITATIONS: The current model is constrained by an addressable memory. As a result, logistics analysis and combat activities cannot be run in parallel but must be run in series. The current model design prevents queueing of orders for a unit. Consequently unit moves can only be made one step at a time.

**HARDWARE:**

Type computer: Altos (ACS 8000-10 [MP/M-II])  
Operating system:  
Storage requirements: 128k random access memory  
Peripherals: Televideo 820 monitor, Info Scribe 1000  
printer.

**SOFTWARE:**

Programming language: PASCAL  
Documentation: "Players' Guide to the USAWC Theater  
and Corps Operations and Planning Simulation - TACOPS,"  
USAWC, 1984; distribution of this document is limited.

**GENERAL DATA:**

Time requirements: Data Base: prep - 6 man-months  
CPU Time per Cycle: 48 times clock  
time in interactive mode

Data Output Analysis:

Security classification: UNCLASSIFIED

Frequency of use: 50 times per year

Users: US Army War College, US Air War College, US  
Naval War College, US Army Combined Arms and General Staff  
College, US Forces Korea, VII Corps

**POINTS OF CONTACT:** (proponent) 717-245-3843; AV 242-3843

**KEYWORD LISTING:** Operational level, theater level, corps  
level, air-land battle, ground forces, tactical air forces,  
logistics, deterministic computer model.

**CATALOG LISTING:** Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.

TITLE: TACSIM - Tactical Simulation 1

MODEL CATEGORY: Command, control, communications, and intelligence

PROPONENT: US Army Intelligence Center and School, (USAICS)

DEVELOPER: TRW Corporation

PURPOSE: The game is designed as a simulator test environment emphasizing the combat intelligence process and information flow.

GENERAL DESCRIPTION: The game is generally two-sided and consists of four integrated components: Battlefield environment, collection environment, processing environment, and force-on-force. Representation of the Blue force battlefield perception is included.

INPUT: Being developed

OUTPUT: Being developed

MODEL LIMITATIONS: Being developed

HARDWARE: VAX 11/780 computer

SOFTWARE:

- o Programming Language: FORTRAN
- o Limited documentation available

TIME REQUIREMENTS: Being developed

SECURITY CLASSIFICATION: UNCLASSIFIED

FREQUENCY OF USE: Being developed

USERS: CACDA, Fort Leavenworth

POINT OF CONTACT: Dr. Larry Pfortmiller  
CACDA  
Fort Leaveworth, KS 66027  
Telephone: AUTOVON 552-5258

KEYWORD LISTING: Two-sided

CATALOG LISTING: ABCA Catalog of War Games, Training Games, and Combat Simulations. Quadripartite Working Group on Army Operational Research, 1983. Prepared by Office of the Deputy Undersecretary of the Army (Operational Research)

Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: TAC SUPPRESSOR

MODEL CATEGORY: Conflict other than strategic nuclear/air-ground forces - conventional conflict

PROPOSER: Electronic Warfare Management Group (ASD/RWX),  
Wright-Patterson AFB, Ohio 45433

Air Force Center for Studies and Analysis,  
(AF/SAGR), HQ USAF, The Pentagon, Washington, DC 20330

DEVELOPER: CALSPAN Corporation (original), Advanced  
Technology Center, PO Box 400, Buffalo, NY

BDM Corporation (update), One First National  
Plaza, Dayton, Ohio 45402

PURPOSE: TAC SUPPRESSOR is a general-purpose simulation model useful for evaluating the effectiveness of air and land weapon systems, jamming systems, tactics, and command and control procedures. It was developed to address air defense and defense suppression problems in scenarios larger than one-versus-one but smaller than theater level.

GENERAL DESCRIPTION: TAC SUPPRESSOR is a player-oriented, event-stopped, simulation model. The elements which comprise each player and their capabilities enable a wide variety of player types to be simulated. Typical player types used in TAC SUPPRESSOR have included fighter aircraft, bombers, SAM batteries, AAA batteries, truck convoys, and command units. Due to its efficient use of data structures and internal memory management, there is much flexibility in the size of a scenario which can be simulated as well as in the level of detail used to define each player. Scenarios ranging from 70 players down to 1-versus-1 have been simulated. TAC SUPPRESSOR is not limited to Air Force scenarios. Naval warfare can be simulated by defining players with the attributes of destroyers, submarines, and other ships. Penetrator strike forces are represented as an aircraft flying preplanned and reactive flight paths. Preplanned flight paths are used for aircraft that are designated to hit target locations which are presumed to be known. Reactive flight allows aircraft to engage targets of opportunity using tactical guidelines defined by the analyst using the model. Air defenses are represented by early warning sites, command centers, and fire units. All units are capable of autonomous operations, as well as varied modes of control by a specified echelon in the chain of command. Threat prioritization and weapon assignment functions are modeled, as well as other typical air defense functions. Missile intercept, is calculated using the target's flight path

and relative geometry. If an intercept occurs, kill results are determined using a Pk table look-up.

DATE IMPLEMENTED: (original) April 1981;  
(update) September 1984

INPUT: User input defines the physical characteristics of the equipment modeled, as well as many of the features that are normally coded directly into most models. The latter features include defining the chains of command and their function, communication networks and their specific functions, and a great deal of the tactics and doctrine used by the opposing modeled forces.

OUTPUT: Printouts of events processed and variables for each event; statistics (averages, standard deviation, frequency distribution) for variables sorted by time windows, player types, or specific players.

LIMITATIONS: No practical limitations on number of sensors, weapons, players, etc; terrain is not played except for masking tables; weather is constant over deviation of scenario and only affects optics and IR sensor detection.

HARDWARE:

Type computer: IBM 370 and IBM 3330, VAX 11/780  
Operating system:  
Storage requirements: 1 Mbyte  
Peripherals: Disk and tapes, line printer, CRT.

SOFTWARE:

Programming language: FORTRAN  
Documentation: User's Manual, Analyst's Manual, Programmer's Manual, Management Summary (published by CALSPAN), Available through AF/SA.

GENERAL DATA:

Time requirements: Data Base:  
CPU Time per Cycle:  
Data Output Analysis:

Security classification: UNCLASSIFIED

Frequency of use:

Users: HQ USAF/SA, ASD/RWX, AFWAL/AAWA, AFOTEC, The BDM Corporation, CALSPAN



POINTS OF CONTACT: (proponent) ASD/RWX - Lt Col Harris  
513-255-2108, AV 785-2108; AF/SAGR - 202-695-5550,  
AV 225-5550

(developer) 513-222-0850

KEYWORD LISTING: General purpose, weapons effectiveness,  
player oriented, event stepped, simulation model

CATALOG LISTING: Catalog of Wargaming and Military  
Simulations Models, 1986. Joint Analysis Directorate,  
Organization of the Joint Chiefs of Staff.



TITLE: TACWAR - USMC Manual War Game-based Training System

MODEL CATEGORY: Conflict other than strategic nuclear/air-ground forces - conventional forces

PROPONENT: Headquarters Marine Corps, (Code T)

DEVELOPER: Naval Training Systems Center, Orlando, FL 32813

PURPOSE: TACWAR is a manual, company level, war-game-based training system designed to supplement field training for small unit leaders in the USMC. TACWAR enables Marine leaders to practice tactical decisionmaking and leadership skills in simulated combat conditions.

GENERAL DESCRIPTION: TACWAR is a two-sided manual simulation which includes the combat assets of a reinforced USMC rifle company and the supporting arms that would normally be made available to a USMC rifle company. The opposing forces have the combat assets of a Soviet Type Motorized Rifle Regiment and its supporting arms. The war game is an open mode which includes stochastic models and is played in slow time (i.e., one minute of combat time equals 8 to 10 minutes of clock time). The system uses a three-dimensional geomorphic terrain board that allows simulation of both cover and concealment. The terrain represents lightly forested rolling hills. Combat assets are represented by counters and micro-armor miniatures down to the fire team and individual weapon systems. Charts, tables, and other aids are used to resolve conflict between units using both direct and indirect fires. Ten-sided die (two) are used to generate random numbers from 1 to 100. Supporting arms are simulated including artillery, air, close support, mortar, naval gunfire, air defense, and armed helicopters. The system allows generation of scenarios by the user and also provides instructions for using the system in a nonwar game mode.

DATE IMPLEMENTED: December 1983

INPUT: Data are required for scenario development only. Some scenarios may require tailoring the war game simulation component of the training systems. During an exercise, players participate in a direct manner with the war game.

OUTPUT: Combat results are provided directly to players.

LIMITATIONS: Logistics simulation is limited, and MOUT and NBC are not simulated.

HARDWARE:

Type computer: None  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: None  
Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time: 2 to 8 hour player  
learning time  
CPU Time per Cycle:  
Data Output Analysis:  
Frequency of Use: 750 times per year total throughout  
Marine Corps  
Users:

POINTS OF CONTACT: (Developer): Naval Training Systems Center,  
Orlando, FL 32813

KEYWORD LISTING: Ground warfare, combined arms, company level  
tactics, USMC rifle company, manual model, war game-based  
training system.

CATALOG LISTING: Catalog of Wargaming and Military Simulations  
Models, 1986. Joint Analysis Directorate, Organization of the  
Joint Chiefs of Staff.

**TITLE:** TAM - Theater Analysis Module

**MODEL CATEGORY:** Conflict other than strategic nuclear/theater level - multiservice

**PROPONENT:** Director, Net Assessment, Office of the Secretary of Defense (OSD), The Pentagon, RM 3A930, Washington, DC 20310

**DEVELOPER:** Booz, Allen & Hamilton Inc., Military Operations Analysis Practice, 4330 East-West Highway, Bethesda, MD 20814

**PURPOSE:** The TAM is a theater/sub-theater level war game supplement to the Strategic Analysis Simulation (SAS). It is used for both training and analysis. It is played either in support of the global Strategic Analysis Simulation or as a stand-alone game. The TAM allows analysts to assess, under dynamic conditions, the effectiveness of various forces and to evaluate the employment issues and operational doctrines that affect theater-level military actions in any area of the world.

**GENERAL DESCRIPTION:** TAM is a tactical war game designed to be played at the operational level. The Theater Analysis Module contains forces at the level of corps, division, or brigade; aircraft squadron; or battle group of ship. These forces can be played at the level shown or can be further broken down into component parts such as maneuver, support, or artillery battalions; flights (or aircraft); ships; or special units (e.g., engineer or missile battalions). In addition, players can play nuclear missile sites, nuclear storage, airbases, seaports, nonnuclear storage, other facilities, consumables (fuel, ammo, provisions), or nonconsumables (replacement and items). The game is played on a Defense Mapping Agency ONC map having a scale of 1 to 1,000,000. The game moves are on day's duration with 8-hour substeps. Controllers perform adjudication of combat actions after each move. The adjudication process is performed manually by TAM-trained controllers using written game rules and adjudication tables. The Control Group, usually three to five members, performs the adjudication and, in addition, the necessary interface operations between the players and the gaming system so that players do not have to know or learn the gaming system

**DATE IMPLEMENTED:** February 1985

**INPUT:** Order-of-battle and organizational data for each team; pre-game deployments, movements, engagements, and force allocations; and operations order (OPORDs).

**OUTPUT:** The TAM output is in the form of force status reports. Separate battles are independently adjudicated and reported. Summary turn results are given at the end of each turn.

LIMITATIONS: Combat and logistics are aggregated.

HARDWARE:

Type computer: None  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: None  
Documentation:

GENERAL DATA:

Time requirements: Data Base: preparation - 1 man-month  
Set-up time: 4 to 6 hours playing time  
(per time step)  
CPU Time per Cycle:  
Data Output Analysis:  
Frequency of Use: 1 to 2 times per year  
Users: OSD/Net Assessment

POINTS OF CONTACT: (Proponent): CAPT C. Pease, 202-697-1312  
(Developer): Dr. K. Masterson, 301-951-2580

KEYWORD LISTING: Theater war game, air-ground-naval force  
movement and engagement model.

CATALOG LISTING: Catalog of Wargaming and Military Simulations  
Models, 1986. Joint Analysis Directorate, Organization of the  
Joint Chiefs of Staff.

TITLE: TAP - Target Analysis and Planning

MODEL CATEGORY:

PROPONENT: U.S. Army Training and Doctrine Command  
(TRADOC), Fort Leavenworth, KS 66027

DEVELOPER: Defense Nuclear Agency, BDM

PURPOSE: TAP facilitates nuclear target analysis and planning.

GENERAL DESCRIPTION: The TAP system provides for user definition, storage, display, analysis and planning of order of battle, situation, targeting and weapons systems required for corps nuclear/conventional and chemical target planning and analysis.

INPUT: Order of battle.

OUTPUT: Target analysis and damage assessment, cross-reference map sheet, photograph to video map, intelligence update and display, orders of battle display, display library of map symbols used and edit map data.

MODEL LIMITATIONS:

HARDWARE:

Computer (OS): APPLE II (8-bit), 16-bit Corvus Concept  
Memory:  
Storage:  
Peripherals: Corvus hard disk system, video disk

SOFTWARE:

Programming Language: PASCAL  
Documentation: "BDM Target Analysis and Planning (TAP)  
System Field User's Manual," 1 June 1981

GENERAL DATA:

Time requirements: Data Base: acquisition - 3  
man-months, preparation - 3  
man-months  
Set-up Time: 2 man-weeks player  
learning time  
CPU Time per Cycle:  
Data Output Analysis:

Frequency of Use: Presently used in demonstrations at Fort Leavenworth. Will be used at Fort Leavenworth in support of CGSC and CATTs exercises.

Security classification:

Users: BSD

Miscellaneous:

POINTS OF CONTACT: (Proponent): Mr. H. Westmorland,  
AV684-4528

KEYWORD LISTING: Computerized, analytical, nuclear, damage assessment, tactical nuclear weapons, target analysis planning

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.



TITLE: TEWTORIAL

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only

PROPONENT: MA4 Branch, RARDE, UK

DEVELOPER: As Above

PURPOSE: TEWTORIAL was designed to provide a means of taking a quick look at various concepts for an improved weapon or tactical approach. The concepts that do best in the TEWTORIAL study can then be gamed thoroughly in the Battle Group War Game or by other means.

GENERAL DESCRIPTION: (As this technique was developed to be used with different weapon/tactical concepts, the level of aggregation and other details may vary between different applications.) The technique is usually used as an open two-sided game in which most events are stochastic (e.g., weapon effects, target acquisition, etc.) though some (max vehicle speeds, etc.) are deterministic. It works in a movement time slice of up to 5 minutes, but with acquisitions assessed on a short period, usually one minute, and shots assessed on a shorter period still. If used for an ATWG study, the smallest units used would usually be tank troops, infantry platoons and individual ATGW with their detachments. The level of play is usually a Blue battle group against a Red regiment. The game is designed to be taken to military units to be played.

INPUT: Weapon characteristics (accuracy, lethality, response times, etc.); Acquisition rules; Movement rules; ORBATS; Scenarios

OUTPUT:

- o Military judgment, from the control staff and players, of the worth of the various concepts played
- o Data on ranges of engagement, exchange ratios, target arrays, etc., can be recorded as required for the study

MODEL LIMITATIONS:

- o Lack of detail in the results because of the level of aggregation
- o Relatively crude differentiation of input data, because of manual play

HARDWARE:

- O The technique does not normally use computer support but one version used with computer support uses Sinclair 2481 micro-computer
- O Photographically enlarged maps mounted on steel sheets
- O Magnetic office symbols on which the conventional military symbols for the units represented have been drawn

SOFTWARE:

- O Manual "look-up tables" of the types of data needed for the concept being studied
- O Special data-recording performae appropriate to the type of data needed for the study

GENERAL DATA:

Time requirements: Once the players have been briefed and had a short practice game (requiring about half a day), the same Blue player team can play between 1 and 2 battles a day, depending on the scenario.

Security classification: The details of the technique are not classified. Input and output data may be classified, depending on the concept being gamed.

Frequency of use: As required. It has been used so far in two studies.

Users: MA4 Branch, RARDE; British aerospace, Stevenage

Miscellaneous: A version of this technique, supported by a Sinclair ZX81 micro-computer, is in use to train officers and NCOs for ATGW units.

POINT OF CONTACT: PO/BGWG, MA4, RARDE, Sevenoaks, England.

KEYWORD LISTING: Open, two sided, stochastic

CATALOG LISTING: Catalog of Wargaming and Military Simulaiton Models, 1986. Joint Analysis Directorate, OJCS

TITLE: TFG - Task Force Game

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional conflict

PROPONENT: LA1 Division, DOAE, West Byfleet, Surrey, England

DEVELOPER: As Above

PURPOSE: The game is being developed as an investigative tool to be used along side other existing computer based combat models in force mix studies.

GENERAL DESCRIPTION: TFG is a two-sided, computer assisted, open game currently being played at a small task force level (two Blue battlegroups). The smallest units represented are Blue infantry platoons and tank troops and Red infantry and tank companies. The game progresses in time slices whose duration can be varied (typically 5 or 10 minutes). All rules are currently deterministic and casualty assessments are made by an on-line routine which uses data generated by the DOAE Battlegroup Model (BGM, q.v.). The terrain model is an enlarged (by a factor of 3) 1:50,000 scale map. Average line of sight probability is included in the casualty assessment routine, with the exception of forested and urban areas whose interference with line of sight is considered explicitly.

INPUT:

- O Scenario
- O ORBATs
- O Movement rules
- O Force on force attrition data, at the level of resolution described above. (This data is generated by the BGM)

OUTPUT: Battle statistics: typically, the frequency of occurrence of low level tactical situations, casualties and battle duration

MODEL LIMITATIONS:

- O Absence of command and control
- O Deterministic casualty assessment places a lower limit on resolution

HARDWARE: ICL 2900

SOFTWARE: Casualty assessment program written in FORTRAN and occupies 500 kilobytes

GENERAL DATA:

Time requirements:

- O One week to start a series, 1-3 hours for a single game
- O Game time varies between 1 and 2 days

Security classification: Methodology: This description UNCLASSIFIED; more detailed description UK RESTRICTED. Database: Usually UK SECRET.

Frequency of use: Periodic

Users: LAI Division, DOAE

POINT OF CONTACT: LAI Division, DOAE  
West Byfleet  
Surrey, England  
Phone: Byfleet (09323) 41199

KEYWORD LISTING: Force-mix studies, two sided, computer assisted, open, deterministic

CATALOG LISTING: Catalog of Wargaming and Military Simulation Models, 1986. Joint Analysis Directorate, OJCS

TITLE: TWSEAS FMC - Tactical Warfare Simulation Evaluation and Analysis System, Field Maneuver Controller (FMC) Program

MODEL CATEGORY:

PROPONENT: Naval Ocean Systems Center

DEVELOPER: NOSC Code 8312, C3I Systems Engineering Division, Marine Corps Engineering and Development Branch

PURPOSE: The TWSEAS FMC is a computer-assisted system which is used to design, provide realtime control, and evaluate major Marine Corps tactical field exercises and experiments.

GENERAL DESCRIPTION: The TWSEAS FMC provides for exercise design according to specific exercise requirements such as combat unit identification, weapons/equipment identification, type of exercise - single-sided or two-sided, etc. The TWSEAS FMC performs realtime control of an exercise by supporting highspeed digital communication from field units over normal tactical communications nets; provides on-line, responsive data processing, storage and retrieval; and simulates weapon effects and provides a realistic representation of combat conditions in which the realtime control of forces is facilitated, through centrally-directed umpire actions. The simulated combat environment is intergrated and controlled from the TWSEAS Troop Exercise Control Operations Center (TECOC). TWSEAS FMC maintains a complete transaction file of all exercise data generated during the exercise. This exercise transaction file, in conjunction with the initial exercise data base, constitutes a complete exercise history file, maintained on magnetic tape, which is availabe for subsequent exercise replay and exercise evaluation.

INPUT:

1. Exercise data base defining organizational structure of participating units, developed by the exercise control organization
2. Digital messages reporting simulated combat activity, input by field umpires through Digital Message Entry Devices (DMEDS)
3. Controller commands managing simulated combat engagements, entered by Maneuver Controllers located at the TECOC site

OUTPUT:

1. Operational reports consisting of English-translated DMED entries, augmented with computer-generated simulation data such as casualty/damage assessment, firepower scores, combat power ratios,

- probable unit detections, target selection for indirect fire weapons, etc.
2. Exercise history file comprised of the initial exercise data base and all exercise transactions received during the exercise

#### MODEL LIMITATIONS:

1. A maximum of 100 combat units can be initialized in the data base.
2. A maximum of 100 types of DMED messages
3. Geographic area of coverage limited only by supporting tactical communications

#### HARDWARE:

1. Computer: UNIVAC AN/UYK-7 Computer
  - a. Minimum memory - 96K words or 384K bytes
  - b. Maximum memory - 256K words or 1024 bytes
  - c. 16 NTDS fast I/O channels
2. Operating System: NOSC-developed FMC operating system
3. Peripheral Equipment:
  - a. CDC 640M Disk - 640 million bits capacity
  - b. UNIVAC 1840 Magnetic Tape Unit - 2 tape drives
  - c. Alphanumeric Display Subsystem - AN/UYK-12 computer supporting 8 smart terminals
  - d. Teletype Subsystem - AN/UYK-12 computer, eight Model 43 Teletypes, four CRT displays and a four-channel modem
  - e. Operator's Console - Model 43 Teletype and paper tape reader/punch. The UNIVAC 1532 I/O console is emulated by the Alphanumeric Display Subsystem's AN/UYK-12 computer.
  - f. Geographic Display Subsystem - Aydin 5218 Display Processor with four-color monitors and keyboards. Map representation is performed using slides and flying spot scanners and a video mixer which mixes which mixes map analog video with digital video.
  - g. Digital Communication Terminal - Receives DMED transmission over a maximum of four different frequencies. Performs error detection and some correction of digital transmission.

#### SOFTWARE:

1. Programming Architecture - All FMC software, including operating system (Executive) software, is a modular design with the following program module entries:

- a. Interrupt Entry - Highest priority entry. A non-scheduled program entry which may occur according to fixed hardware priorities.
  - b. Demand Entry - Executive only. The highest scheduled program entry. Normally used for processing I/O completion operations.
  - c. Intermodule Message Entry - Executive and application modules. The primary form of communication between modules. Intermodule messages may be used to pass data between modules, specify tasks to be performed, specify task completions, etc.
  - d. Periodic Entry - Executive and application modules. This module entry is used for performing tasks which occur at a fixed interval of time, such as simulating indirect fire, assessing casualty/damages of a combat engagement, etc.
  - e. Background Entry - Executive and application modules. Lowest scheduled entry. Background processing is only performed when there are no higher priority, realtime functions to perform. Background tasks are time sliced to insure that realtime tasks are processed in a reasonable time. Background entries are normally used for non-time-critical tasks such as report generation.
  - f. Preset Entry - Executive and application modules. Initial one time entry to enable a module to perform any required initialization processing.
2. Programming Language: Compiler Monitor System - 2 (CMS-2)

DOCUMENTATION: NOSC TN 122 of 30 September 1980 and program listings

GENERAL DATA: Security classification: Unclassified

Frequency of use: Approximately eight times per year

Users: MCDEC, Quantico, VA; FMF Pacific, Camp Pendleton, CA; and FMF Atlantic, Camp Lejeune, NC

POINT OF CONTACT: Naval Ocean Systems Center (Code 8312)  
San Diego, CA 92152  
Telephone (619) 225-7911  
Autovon 958-7911

CATALOG LISTING: Catalog of NOSC Simulation Capabilities and Models. Naval Ocean Systems Center, San Diego, CA.





TITLE: TWSEAS-IMC - Tactical Warfare Simulation, Evaluation and Analysis System - Integrated Maneuver Controller

MODEL CATEGORY: Amphibious warfare

PROPONENT: Headquarters, U.S. Marine Corps

DEVELOPER: Naval Training Systems Center, Orlando, FL 32813

PURPOSE: TWSEAS-IMC is a computer-assisted, command and control, war-game-based training system designed to support Marine Corps war games, troop landing and field maneuvering exercises, staff-oriented training games such as command post, and map maneuver exercises.

GENERAL DESCRIPTION: The TWSEAS-IMC system is designed to create and manage simulations of amphibious force combat operations. It can receive inputs from digital message entry devices reporting ongoing simulated combat activity in amphibious training exercises. It can also receive inputs from system consoles and peripheral devices in the form of commands and directives from staffs controlling command post exercises (CPX) and map maneuver exercises. Data processing elements of TWSEAS-IMC are housed in a transportable computer shelter, and display peripherals are housed in a transportable tactical operations center identified as the Tactical Exercise Control Center (TECC). Consoles are provided in the TECC for centralized control of various kinds of exercises.

DATE IMPLEMENTED: Under development. To be determined.

INPUT: Combat orders, as transmitted by the player staffs, are reduced to the prescribed message formats for acceptance by the computer and entered through terminals.

OUTPUT: Event-oriented solicited and unsolicited reports are generated in the form of messages at the appropriate terminals and reinforced at graphic displays

LIMITATIONS:

HARDWARE:

Type computer: AN/UYK-7  
Operating system:  
Memory: 229,376 words of memory  
Storage requirements:  
Peripherals: 2 CPUs, and 16 channels

SOFTWARE:

Programming language: CMS-2  
Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:

Frequency of Use: Monthly (three systems are currently fielded and a fourth is planned)

Users: Fleet Marine Force and formal schools at MCDEC

POINTS OF CONTACT: (Proponent): Project Director (PD-303)

KEYWORD LISTING: Amphibious warfare, ground combat, ship-to-shore, computer assisted, command and control.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: TWSEAS MMC - Tactical Warfare Simulation Evaluation and Analysis System, Map Maneuver Controller (MMC) Program

MODEL CATEGORY:

PROPONENT: Naval Ocean Systems Center

DEVELOPER: NOSC Code 8312, C3I Systems Engineering Division, Marine Corps Engineering and Development Branch

PURPOSE: The TWSEAS MMC is a computer simulation which provides Commanders and staffs of Marine Air-Ground Task Forces with a dynamic simulated combat environment in which simulated subordinate units may be directed to execute offensive and defensive combat tasks to accomplish mission objectives against a simulated opposing force (OPFOR). The outcome of the ensuing simulated combat is determined by applying war gaming techniques to measure the combined effects of the force ratios and weapon systems represented and the tactical decisions implemented.

GENERAL DESCRIPTION: The TWSEAS MMC is designed to function as an integral part of exercise control organizations supporting either one-sided or two-sided command post and map maneuver exercises at the Marine Corps Development and Education Command and in the Fleet Marine Forces. MMC provides the data processing and simulation capabilities required for centralized, realtime control of exercise play and post-exercise replay and evaluation. Combat directives issued by exercising commanders and staffs to their subordinate units are transmitted to the simulation software by controllers functioning as part of the exercise control organization. The simulation software carries out the directives, updating the locations of the simulated air and ground units, accomplishing detections of opposing forces, initiating weapon system and ground combat interactions and calculating the resulting outcomes of the interactions. Exercise information regarding the course of the combat interactions and outcomes is displayed electronically for controller feed-back to the appropriate command and staff sections participating in the exercise.

INPUT:

1. Exercise data base defining organizational structure of participating units, developed by the exercise control organization
2. Data base items defining equipment and weapon characteristics
3. Combat directives issued by exercising commanders and staffs

1. Operational reports reporting the current status of all simulated combat elements
2. Exercise history file comprised of the initial exercise data base and all exercise transactions received during the exercise

#### MODEL LIMITATIONS:

1. A maximum of 210 combat units can be initialized in the data base.
2. The exercise area is limited to an area 1200 km by 1200 km in size.

#### HARDWARE:

1. Computer: UNIVAC AN/UYK-7 Computer
  - a. Minimum memory - 96K words or 384K bytes
  - b. Maximum memory - 256K words or 1024K bytes
  - c. 16 NTDS fast I/O channels
2. Operating System: NOSC-developed FMC operating system
3. Peripheral Equipment:
  - a. CDC 640M Disk - 640 million bits capacity
  - b. UNIVAC 1840 Magnetic Tape Unit - two tape drives
  - c. Alphanumeric Display Subsystem - AN/UYK-12 computer supporting eight smart terminals
  - d. Teletype Subsystem - AN/UYK-12 computer, eight Model 43 Teletypes, four CRT displays and a four-channel modem
  - e. Operator's Console - Model 43 Teletype and paper tape reader/punch. The UNIVAC 1532 I/O console is emulated by the Alphanumeric Display Subsystem's AN-UYK-12 computer.
  - f. Geographic Display Subsystem - Aydin 5218 Display Processor with four color monitors and keyboards. Map representation is performed using slides and flying spot scanners and a video mixer which mixes map analog video.
  - g. Digital Communication Terminal - Receives DMED transmission over a maximum of four different frequencies. Performs error detection and some correction of digital transmission.

#### SOFTWARE:

1. Programming Architecture - All MMC software, including the operating system (Executive) software, is of modular design.

2. All procedures in the system are executed either by demand (interrupted by input command) or periodically.
3. Programming Language: Compiler Monitor System-2 (CMS-2)

DOCUMENTATION: MMC Program Performance and Design Specifications, System Operators Manual, Program Listings

GENERAL DATA:

Security classification: Unclassified

Frequency of use: Approximately fifty times per year

Users: MCDEC, Quantico, VA; FMF Pacific, Camp Pendleton, CA; and FMF Atlantic, Camp Lejeune, NC

POINT OF CONTACT: Naval Ocean Systems Center (Code 8312)  
San Diego, CA 92152  
Commercial (619) 225-7911

CATALOG LISTING: Catalog of NOSC Simulation Capabilities and Models. Naval Ocean Systems Center, San Diego, CA.



TITLE: TWX - Theater War Exercise

MODEL CATEGORY: Conflict other than strategic nuclear/theater level - multi-service

PROPONENT:

DEVELOPER: Air War College (AWC) and Education Computer Science Branch (AU/ACDY)

PURPOSE: The TWX is designed to allow players to gain insights into decision processes which relate principles of war, warfighting systems, and force employment decisions to military objectives of war. The exercise may be tailored for specific applications and each user determines his own objectives for TWX players.

GENERAL DESCRIPTION: TWX is a two-sided, theater-level wargaming exercise which uses computerized air and land battle simulations to assess the impact of player resource allocation decisions in a NATO Central Region conflict scenario. The air battle is dynamic and outcomes depend on force employment decisions made by BLUE players who represent the commanders of Allied Air Forces (AAF) and Second and Fourth Allied Tactical Air Force (ATAFs), and RED players who represent the commanders of Warsaw Pact Frontal Aviation and appropriate Tactical Air Armies. Moreover, players are compelled to select alternatives based on less than perfect information on both their own and opposing forces. The land battle is preprogrammed over an initial 5-day conventional battle sequence representing the onset of a Pact military intrusion into Western Europe; the major variable influencing the land battle is tactical air power. The TWX forces are derived from unclassified sources and relative balance is projected for a time-frame of 12 to 18 months from the date of game play. The TWX allows interactive decisions to influence such things as air forces' beddown, logistics, and dispersal. In addition to the high-level (AAFCE) decisions which tailor air forces to the derived mission, the full range of tactical air missions is available to allow each ATAF to achieve assigned objectives including offensive and defensive counterair, offensive air support (close air support and battlefield air interdiction), air interdiction, combat air patrol, defense suppression and electronic countermeasures, tactical air reconnaissance, and tactical airlift. In addition, Strategic Air Command contingency forces and Strategic Reserve tactical air units may be time-phased into the TWX. Sufficient quantitative data are provided to allow assessment of the 5-day battle segment relative to player-determined mission and objectives. Overall, the TWX provides insights into decision processes and events which could affect the allocation of tactical air power and a warfighting system at the theater

level. It also allows players to examine the outcomes of force employment decisions in an intensive air campaign conducted in a high-threat environment.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: The TWX is used only to gain insights into decision processes impactong on theater-level warfare. TWX does not explicitly address command and control or the procedures required to execute the air missions planned by the players. Moreover, players are enjoined to not draw conclusions concerning capabilities of either NATO or the Warsaw Pact as a result ot their experience inthe TWX. TWX has 80 air bases per side, 50 aircraft land units per side, 9 types of air missions, 3 weather states (poor, fair, good), and 5 exercise days.

HARDWARE:

Type computer: Honeywell 6060  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language: FORTRAN  
Documentation: Each major user provides player documentation which describes broad concepts, weapon systems, computer products and procedures, and selected scenario.

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:  
  
Frequency of Use:  
Users: AWC, ACSC

POINTS OF CONTACT:

KEYWORD LISTING: Two sided, theater level, computerized, air and land battle simulations.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.



TITLE: UNIFLO - Production Planning Exercise

MODEL CATEGORY: Miscellaneous - production planning; also mobilization/industrial preparedness

PROPONENT:

DEVELOPER: Air Force Institute of Technology, School of Systems and Logistics (AFIT/LS)

PURPOSE: UNIFLO is used to provide students with experience in master loading and leveling problems in a job shop operation. The students will experience the need for teamwork, clear communications, planning, and priority consideration in real-world problem-solving. The exercise uses a systematic approach to problem-solving and gives the students an appreciation of the impact of long-range production planning on other corporate functions.

GENERAL DESCRIPTION: UNIFLO is primarily a production planning exercise conducted in a company manufacturing a temperature sensing device for various applications in jet and reciprocating engines. The product is highly competitive and is used by the Army, Navy, Air Force, Defense Logistics Agency, and commercial enterprises. The Benlus Company holds a prime position in the industry, having manufactured this item for many customers during the Vietnam war. The company has adequate capacity to handle projected workloads and subcontracting is not anticipated. Management has followed a policy of producing at rates equal to the forecasted sales rate on a monthly basis. This has meant overtime work during peak seasons and partial shift operations during slack times. Annual sales forecasts have been highly accurate in the past but monthly predictions have been off by as much as 35 percent. In an effort to streamline production, an extensive recruiting effort has resulted in the hiring of a new production management team whose task is to optimize production planning.

DATE IMPLEMENTED:

INPUT:

OUTPUT:

LIMITATIONS: Students must adhere to all operational parameters; no subcontracting is allowed; maximum production is 14,800 units per month using 2 shifts; maximum overtime of 2 hours can be used with one shift operation only; all orders must be filled; and an ending inventory of 12,000 units is required.

HARDWARE:

Type computer:  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation: Student handouts

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:  
Frequency of Use:  
Users: AFIT/LS

POINTS OF CONTACT:

KEYWORD LISTING: Production planning.

CATALOG LISTING: Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.

TITLE: VIC - VECTOR IN COMMANDER

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/air-ground forces - conventional conflict

PROPONENT: U.S. Army TRADOC Analysis Center (TRAC), White Sands Missile Range, NM 88002

DEVELOPER:

PURPOSE: VIC is a computerized, analytical, mid-intensity model developed for use in estimating net assessments, performing force deployment studies, and generating information for performing trade-offs among weapon systems. The outcome of force interactions is determined in terms of the ground gained or lost and attritions of personnel and weapons systems.

GENERAL DESCRIPTION: The VIC model is a two-sided, deterministic simulation of integrated land and air combat. The level of aggregation is the maneuver battalion or its equivalent. It employs forces up to the level of a U.S. Corps facing an enemy of strength determined by scenario and theater in which the simulation takes place. VIC is an event-stepped model which also employs time steps for scheduling some actions. It uses modified differential equations for combat outcomes based upon the VECTO-2 Model. Tactical decisions and force employments are determined by tactical decision tables supplied by the user to provide flexibility in controlling model processes. Each side may employ maneuver unit weapon systems and weapons of tactical aircraft, as well as artillery, mines, helicopters, air defense systems, and other means of conducting combat at the U.S. Corps level.

DATE IMPLEMENTED:

INPUT: Forces and supply inventories, basic weapons performance data, other system performance data, geographic and terrain data and tactical decision tables.

OUTPUT: Casualties and systems losses (killer/victim scoreboards, etc.), FLOT traces and force positions over time, target acquisition and intelligence summaries, availability and condition of forces and supplies, and air battle and air defense results.

LIMITATIONS:

HARDWARE:

Type computer: VAX 11/780 (VMS)  
Operating system:

Storage requirements: 2 Mbytes  
Peripherals: CRT, high-speed printer

SOFTWARE:

Programming language: SIMSCRIPT II.5  
Documentation: Data Input Guide

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:  
Frequency of Use: Continuous  
Users: TRASANA

POINTS OF CONTACT: (Proponent): Mr. A. Gamble, AV258-2951

KEYWORD LISTING: Computerized, analytical, two sided,  
deterministic, event stepped.

CATALOG LISTING: Catalog of Wargaming and Military Simulations  
Models, 1986. Joint Analysis Directorate, Organization of the  
Joint Chiefs of Staff.

TITLE: WAR EAGLE

MODEL CATEGORY: Land warfare, corps level

PROPONENT: Combined Arms Training Activity, Ft  
Leavenworth, KS

DEVELOPER: As Above

PURPOSE: To simulate combat operations and train corps and  
division command groups as well as key staff agencies.  
Specific purposes of WAR EAGLE are:

- 0 Train division and corps commanders and staff in the  
control and coordination of combined arms  
operations.
- 0 Allow units to examine tactical SOP.
- 0 Provide a means to practice Operations Plans (OPLAN)  
and other contingency operations.
- 0 Provide a ready means to brief incoming members of  
units on existing TAC SOP and OPLAN.

GENERAL DESCRIPTION: WAR EAGLE is a corps level  
application of the "FIRST BATTLE" low resolution simulation  
system now in use with all US Active and Reserve  
divisions. Essentially, FIRST BATTLE systems are used  
simultaneously to provide battle information to the  
division tactical operations centers and ultimately to the  
corps TOC. The system is designed to replace the formerly  
used master incident list based CPX and provide a realistic  
series of unexpected events in a realtime sequence. WAR  
EAGLE is a training system based on a design that generates  
problem solving situations for the command and staff at  
corps level.

WAR EAGLE is scenario independent and permits  
commanders to execute plans against a realistic,  
"thinking" opponent in a free-play, open or closed CPX mode  
on any terrain for which a 1:50,000 set of maps can be  
obtained. It reduces preparation time considerably for map  
maneuver of CPX in that no "canned" message play needs to  
be compiled.

Production kits were distributed to every Active Army  
Corps, Maneuver Area Command, and several FORSCOM and  
TRADOC agencies. The kit includes a copy of the FIRST  
BATTLE basic rules and supplements, a WAR EAGLE organizer's  
guide, and a 35mm slide presentation.

INPUT: OPLANS, unit SOPs, unit operations orders, etc.

OUTPUT: FEBA movement.

MODEL LIMITATIONS: Player controller requirement.

HARDWARE: Manual simulation. Communication support required based on specific configuration.

SOFTWARE: Appropriate maps of the geographic area to be used.

STAFF: Controllers: TBD by unit.

GENERAL DATA:

Time requirements:

- O Training Required: 10 hrs (+)
- O Playing Time: 48 hrs (+)

Security classification: Unclassified. Actual game classification will depend on operation plan being simulated.

Frequency of use: Periodic

Users: Corps HQ staffs

POINT OF CONTACT: Combined Arms Training Activity  
ATTN: ATZL-TA  
Ft. Leavenworth, KS 66027  
Autovon 552-3180  
Commercial (913) 684-3180

KEYWORD LISTING:

CATALOG LISTING: U.S. Army Training Support Center  
Bulletin Number 84-1. U.S. Army Training Support Center,  
Ft. Eustis, VA.

TITLE: WASGRAM - War-at-Sea Graphical Analysis Model

MODEL CATEGORY: Naval models - nuclear combat at sea; also conventional engagements

PROPOSER: Chief of Naval Operations, OP-91

DEVELOPER: Naval Warfare Analysis Department, Johns Hopkins Applied Physics Laboratory, Laurel, MD 20707

PURPOSE: WASGRAM is an interactive, computer-assisted graphics model used for both analysis and training. It is designed to simulate carrier task group operations in a multi-threat environment.

GENERAL DESCRIPTION: WASGRAM is an interactive, time-step, dynamic simulation. The model considers friendly carriers, surface ships, submarines, VP aircraft, VS aircraft, AEW aircraft, helicopters, interceptors, attack aircraft and enemy surface ships, submarines, and air raids on an individual basis with a maximum of approximately 1,000 units interacting together. Simulated time is treated on a selectable time-step basis. The game time ratio is approximately 1:5 if the maximum number of units is used. The primary solution technique is kinematic with probabilistic assessment of interactions between RED and BLUE forces.

DATE IMPLEMENTED: 1975

INPUT: Unit positions, detection ranges, and probabilities; enemy air, surface, and subsurface tracks; weapon types and characteristics; various probabilistic assessment factors; communications and radar jamming factors.

OUTPUT: Event-by-event chronology, engagement summary, and damage assessment.

LIMITATIONS: 1,000 units; because the game is interactive, the time to complete a single replication will depend directly on the number of units and the scenario.

HARDWARE:

Type computer: IBM 370/158  
Operating system:  
Storage requirements:  
Peripherals:

**SOFTWARE:**

Programming language: PL/1  
Documentation: "An Introduction to the War-at-Sea Graphical Analysis Model (WASGRAM)," APL/JHU/PAG No. 62-75, CNO/OP-96-CM-3300, October 1975

**GENERAL DATA:**

Time requirements: Data Base: preparation - 4 man-days  
Set-up Time: 16 hours player training time  
CPU Time per Cycle: approximately 30 seconds  
Data Output Analysis: 4 hours  
Frequency of Use: Last used 1980  
Users:

**POINTS OF CONTACT:** (Proponent): Mr. T. Modelski/Mr. J. Wang, 953-5000, ext. 7433

**KEYWORD LISTING:** Analytical, training, general war, limited war, air forces, sea forces, computer assisted, deterministic, time step, graphics, war-at-sea.

**CATALOG LISTING:** Catalog of Wargaming and Military Simulations Models, 1986. Joint Analysis Directorate, Organization of the Joint Chiefs of Staff.



TITLE: Exercise "Water Buffalo"

MODEL CATEGORY: Conflict other than strategic nuclear, corps or lower level/ground forces only - conventional.

PROPONENT: Central Studies Establishment, Australia

DEVELOPER: As Above

PURPOSE: Exercise "Water Buffalo" is a tactical war-game designed to illustrate the type of problems encountered by a Divisional Headquarters with a division plus an Armoured brigade in combat. These problems are as follows:

The functioning of the HQs and the allocation of tasks to all personnel on the HQ.

The deployment of forces to meet an invasion threat.

The preparation of Operation Orders.

Planning activities concurrently with controlling operations.

Logistic Support.

GENERAL DESCRIPTION: Exercise Water Buffalo is a closed, tactical, two-sided war-game at Divisional level designed to exercise a Divisional Headquarters staff in the production of an Operational and an Administration Plan for all the phases of war. The game also provides a training facility for Divisional Commanders and their staff in the execution of operational plans. The game may be played employing the major elements of a Divisional Headquarters or with Operational Orders provided employing small player groups of five to seven. The enemy teams will be in the order of five to eight players for both the above types of play. The enemy will commence the game with a prepared set of plans but will have freedom of action during game play. The relationship between game play time and real time varies throughout play with 7 days of actual war being played in three days.

INPUT:

- O Operational Orders

OUTPUT:

- O A measure of the level of training of a Divisional HQ together with the experience gained by the execution of Operation Orders at Division level

MODEL LIMITATIONS:

- O Resolution not below Battalion level

HARDWARE:

- O Handbook

SOFTWARE:

- O Manual war-game

STAFF:

- O Control team five officers and four NCOs
- O Player teams
- O Blue, 100 all ranks; Red, 12 all ranks

GENERAL DATA:

Time requirements:

Preparation: Between one and two days, depending on  
the level of experience

Play: Two to three days

Analysis: Two to three days

Security classification: UNCLASSIFIED

Frequency of use: Twice a year

Users: Field Force Command, 1 Division, 2 Division;  
Command and Staff college; Naval Staff College; DGAD; and  
Army Office

PLANNED IMPROVEMENTS/MODIFICATIONS: Work has commenced on  
the development of a Commuincation Zone. Corps HQ and Main  
Support area series of war-game to support Water Buffalo.

POINT OF CONTACT: Central Studies Establishment

CATALOG LISTING: Catalog of Wargaming and Military  
Simulation Models; 1986. Joint Analysis Directorate, OJCS

TITLE: WPC - Warrior Preparation Center

MODEL CATEGORY: Theater simulation facility/system, Europe

PROPONENT: USAREUR/USAFE

DEVELOPER:

PURPOSE: To train battle commanders to jointly prosecute war.

GENERAL DESCRIPTION: WPC is a facility in EUCOM where battle commander train for war in Europe. WPC provides real time, realistic responses to battle commands, allowing commanders and their staffs practice and training in combat operational planning and execution from division to echelons-above-corps-level.

DATE IMPLEMENTED: 1984

INPUT: From commanders/units being trained: training objectives, GDP(friendly and enemy), build-up scenario, duration, specific objective--airspace management, rear area combat, electronic combat, etc.

From WPC: Exercise plans, operations, threat functions, software, real logistics support for the exercise, pre-exercise training of players, analysis plan, and post exercise reports.

OUTPUT: Simulated battle results, FEBA movement, attrition, generated reports which cause command and staff planning and decision actions and reactions.

LIMITATIONS:

HARDWARE:

Type computer: VAX 11/785  
Operating system:  
Storage requirements:  
Peripherals:

SOFTWARE:

Programming language:  
Documentation:

GENERAL DATA:

Time requirements: Data Base:  
Set-up Time:  
CPU Time per Cycle:  
Data Output Analysis:  
Frequency of Use: 10 - 15 times per year.  
Users: HQ USAREUR, HQ USAFE, VII Corps, NATO G.O. School,  
others.

POINTS OF CONTACT: Commander, WPC, USAFE, Ramstein AFB, W.  
Germany.

KEYWORD LISTING:

CATALOG LISTING: None

END

DATE

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